

The IRON AGE

November 26, 1959 A Chilton Publication The National Metalworking Weekly



Cooper-Bessemer's Miller And
Rotor Tool's Bailey Discuss—

**How to Stabilize
Uneven Earnings
Patterns P. 65**

**Standards Help Cut
Manufacturing Costs — P. 51**

**Computer Controls
Spot Weld Reliability — P. 91**

Digest of the Week — P. 2-3

FOR JOBS LIKE THIS — FOR JOBS LIKE YOURS

EX-CELL-O BUILDS VERSATILITY INTO A FULL LINE OF PRECISION THREAD GRINDERS

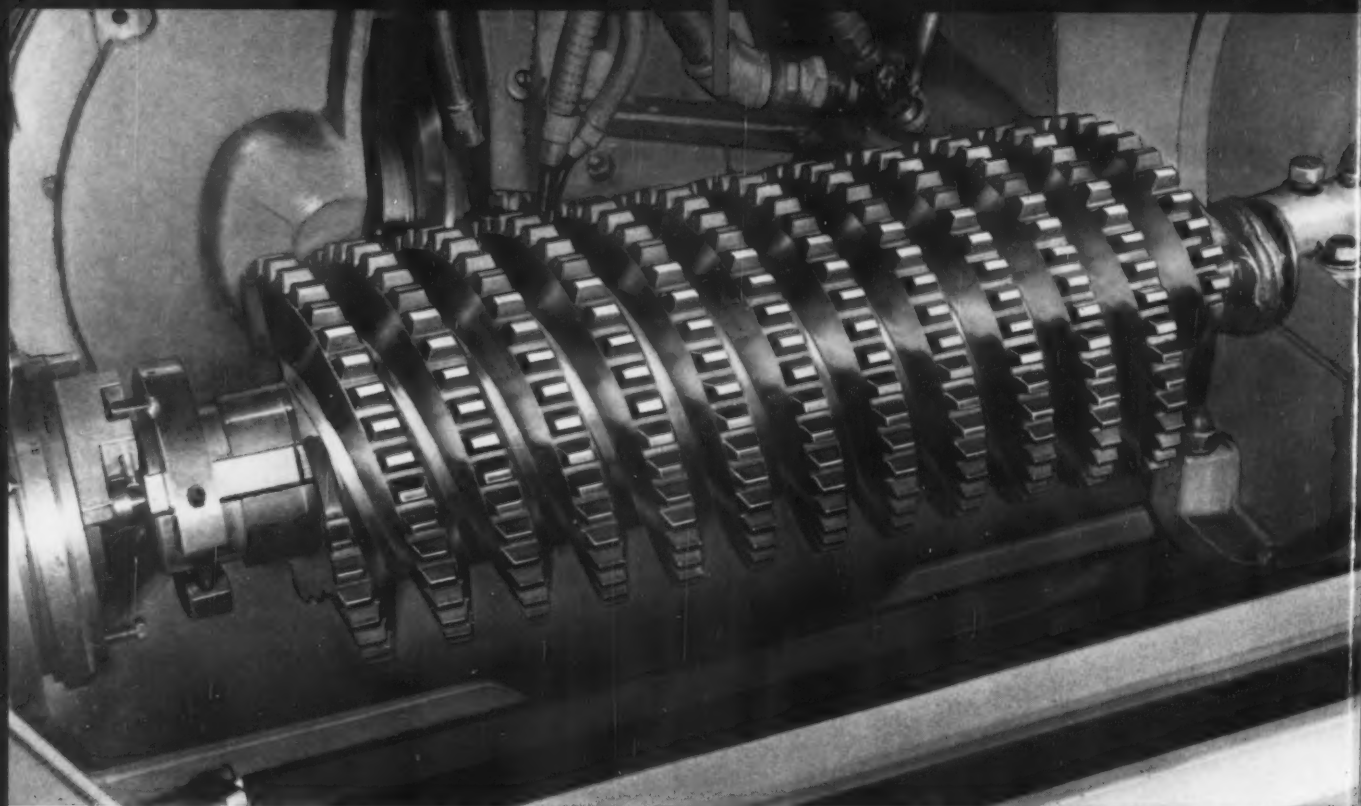


Above:

The Style 36 Precision Thread Grinder used to grind the worm gear shown above is equipped with a standard Three-Way, Cradle-Type Diamond Dresser.

Below:

Huge worm gear, shown during finish grinding, has 10" diameter. Depth of cut is $1\frac{1}{2}$ " with .170" stock removal. Thread form has included angle of 29°, a triple lead of 6°, and a specified pitch diameter of 8.0763".



59-24

A job as tough as grinding this hardened steel worm gear used by a milling machine manufacturer may not be every-day work for an Ex-Cell-O Style 36 Precision Thread Grinder—but it can be!

Ex-Cell-O Precision Thread Grinders combine toolroom accuracy with production output. Inbuilt flexibility makes them ideally suited to a wide range of workpiece shapes and sizes, and the popular Styles 36, 50 and 120 can be optionally equipped for precision grinding of internal threads.

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the right capacity, the preferred automatic features, the proper wheel dresser and the versatility to suit nearly every need. Write direct for the descriptive catalog, or call your local Ex-Cell-O Representative.

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The IRON AGE

November 26, 1959—Vol. 184, No. 22

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STANDARDS PROGRAMS

Pay Big Dividends—Companies with standardization programs are saving \$6 for each \$1 they invest, according to a new survey by the American Standards Assn. But many companies still aren't cashing in on the benefits. P. 51

STEEL LABOR

Latest Offer—The industry's latest offer was made and rejected over a week ago. McDonald is under great pressure by the union organization not to give an inch on work practices. He also has his back to the wall on economic issues. T-H election is still likely. P. 53

OIL COUNTRY GOODS

Shortage Now, But—Because of the steel strike, oil country goods buyers are scrambling for supplies.



But with oil drilling operations falling below hopes, pipe mills are not encouraged about the future. P. 54

Metalworking



COVER FEATURE

NEW PRODUCTS: Cooper-Bessmer's E. L. Miller, left, and Rotor Tool's H. P. Bailey discuss how acquisition of Rotor will smooth out sales peaks and valleys characteristic of the heavy machinery industry. P. 65

ROCKET RESEARCH

Profits—Industry can profit from much of the work done for our space program. P. 56

REVENGE

Planning—Labor leaders are plotting revenge for Congressmen they consider unfair to labor. P. 73

FEATURE ARTICLES

RESISTANCE WELDING

With Better Controls—A new feedback control system computes the variables affecting each successive weld. The control then compensates for these variables by supplying the current needed to produce a proper weld. The result: Greater reliability on the production line. P. 91

CUT DIECASTING REJECTS

Using Adhesive Bonding—It's a sensible move to take the complexity out of diecasting design. The right adhesive can help cut many time-consuming corners and bring rejection rates down to zero. Mechanical fasteners can be eliminated. P. 94

COPPER DEBURRING

Of Sheet Edges—A rotary-file machine is now used to speed the flow of sheet and bar copper at a major brass mill. The new method replaces slow hand systems of fin-

ishing sheet edges. The unit fits right into the existing production line. P. 96

FASTER ROLL FORGING

Of Small Parts—One forging shop now performs all its major operations in presses. No more hammers. The new setup doubles production rates of forgings in the shop while reducing distortion to a minimum. P. 98

CHAIN KNOWLEDGE

Helps Buying Habits—It pays to know the facts about properties and uses of various types of chain, and their relative costs. Then you can choose the right chain for best service at the least cost. P. 102

MARKETS & PRICES

RUSSIAN CARS

No Threat—Ford official reports USSR is not likely to be a force in world auto markets. P. 69

NEXT WEEK

PRODUCTION

Boost It—Here's a four-part system that can help every company meet the heavy demands of the coming metalworking boom. And it can be done without adding one square inch of floor space to your present plant facility.

FARWEST ORDNANCE WORK

Amount Keeps Growing—West Coast's skill in rocket and missile making helps it land Army contracts. Bulk of the business centers in the Southern California area. P. 75

MACHINE TOOLS

Going Abroad—Foreign operations were the big topic at this year's meeting of the National Machine Tool Builders Assn. Most builders believe moving abroad is necessary for survival in world markets. P. 77

STEEL SUMMARY

Shipments Improve—Shipments of steel are moving out better than expected. But they can't move fast enough to avoid further industrial attrition because of lack of steel. Consumption of steel is down to 5 million tons a month, compared with a normal 7 million. P. 127

BEARINGS

Some Closings—Some bearing makers are closing shop until steel supplies are adequate. Others, who have enough, are working at a fast pace to fill orders. P. 128

DEPRECIATION

New Survey—A special survey on depreciation shows what metalworking companies believe should be done on depreciation policies. It raises key questions, including what are the chances of real depreciation reform.



How **B&W JOB-MATCHED TUBING** provides flexibility of design

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Where belts carrying hot sand now last 50% longer

THOSE men are dumping hot sand from molds into a shake-out grid. The 250-degree sand falls through the grid and down on a conveyor belt nine feet below. But the heat is so intense it even blistered and scorched rubber belts that were supposed to have been specially designed for hot-material service. Belts were only lasting 3 or 4 months.

When a B.F. Goodrich man heard of the problem, he recommended a new conveyor belt called Solarflex. This B.F. Goodrich belt is made of a special

rubber that stays soft and pliable at temperatures that cause other belts to harden, crack and finally break down.

Since 1954, B.F. Goodrich Solarflex belts have been used exclusively on this job. Because of their greater resistance to heat, they last from six to nine months—a 50% increase in belt life.

In this plant, the maintenance supervisor had a good rule which hundreds of others like him follow. Instead of accepting the high cost of frequent replacements, he called in a B.F. Goodrich

representative and found exactly what he needed to cut costs and keep the foundry running with fewer shutdowns and delays.

Your B.F. Goodrich distributor has exact specifications for the B.F. Goodrich belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about the many rubber products B.F. Goodrich makes for industry. *B.F. Goodrich Industrial Products Co., Dept. M-751, Akron 18, Ohio.*

B.F. Goodrich *industrial rubber products*

Steel and aluminum users report increased values from Ryerson

These case histories—selected at random from our files, provide additional evidence that you consistently get increased value for your purchasing dollar from Ryerson. Individual points of difference between Ryerson and other sources may not by themselves seem overwhelming—but in total they add up to an important difference in dependability, experience and capacity to serve.

A world famous manufacturer formerly tested all steel purchased from steel-service centers for critical ordnance work. But, often, test costs on small lots of steel were greater than material costs. So the company decided to concentrate its purchases with sources proved completely reliable—and discontinue its own testing. Experience showed that the required certifications of quality were always absolutely dependable in the case of only three steel suppliers—among them Ryerson where quality has been a watchword since 1842.

Milling operation eliminated. A structural fabricator followed the usual practice of milling the ends of beams to be used as column bases until he discovered the accuracy and squareness of Ryerson friction sawing. Now he has eliminated the milling operation because, at no extra cost, Ryerson can guarantee friction saw accuracy of only $\pm 1/16"$ for beams up to 6" and $\pm 1/8"$ for sections over 6"—squareness tolerances of .010" per inch of section.

Better product appearance and a worthwhile saving in material cost resulted when a Ryerson man recommended that a producer of portable coolers switch from one aluminum alloy (3003-H14) to another (5005-H14). Slightly higher structural strength was a bonus value. Unusually broad aluminum stocks and technical resources often enable Ryerson to serve in this way.

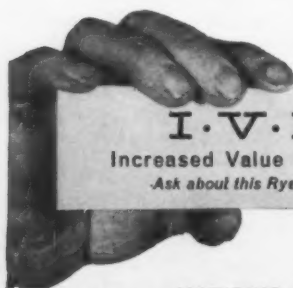
The need was urgent. A breakdown was cutting output of a big paint producer, and the steel needed to repair the break was not available in the area. However, the required analyses and size *was* on hand at the nearest Ryerson plant 200 miles away—and within an hour Ryerson delivered 100' of this bar stock to the local airport. Three and a half hours after calling Ryerson in another state, the customer had his steel.

"Deeper cut, better finish, longer tool life, and lower total per-piece cost." These were the results reported by a Mass. machining company after it switched to Ryerson Rycut® 40 alloy steel for shafts, gears and spindles used in rugged machine tools. Ryerson Rycut steels are the world's fastest machining in their carbon ranges.

Missile component problem solved. Titanium stringers in stainless forged bars were creating a high reject rate for a missile parts manufacturer. His Ryerson specialist recommended a switch from Type 321 stainless to Type 347. Results: the same stabilized corrosion-resistance and strength—but no titanium stringers.

Furniture manufacturer saves 15¢ per unit on every chair produced. A *rolled* aluminum angle was being used where strength was not an important factor. A Ryerson aluminum specialist suggested an *extruded* angle which gave all the strength needed in the application, was more easily formed, had better appearance—and reduced costs as well.

These are just a few examples that illustrate the advantages that make Ryerson service truly unique. A call to your Ryerson representative may solve similar problems for you.



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The New Cold War: Management Vs. the Unions

What was bound to come has come. How long it will last is anyone's guess. What it will do to companies, unions, employees, consumers, and the nation is not yet clear. But it will do something to all of these segments.

We refer to the new cold war between the powerful unions and powerful managements. The management side has had it. The few management people who have cautioned against this fight are a drop in the bucket.

Success for management could mean an end to ruinous inflation, better products at cheaper prices, and passing on to the public—by lower prices—technological improvements. That is the least that can happen. No management group could hog the gains for itself.

Managements everywhere are lined up solidly for the fight to regain the right to eliminate waste and yearly inflationary wage increases. There is no sign that they will throw in the sponge—unless the steel industry loses its fight.

The steel hassle is the opening fight that will be taken up by the railroads, other basic industries, some utilities, shipping interests and eventually the construction industry. There are hundreds of others who will follow suit.

This, then, is the fight of the century. It was overdue. How it will come out is another matter. Certainly the unions will not lie down and play dead. Right now they are alerting all their members for a fight to the finish.

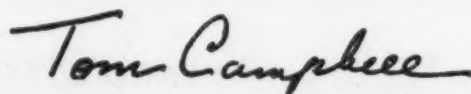
In the past—late 1800's and early 1900's—it took more than 30 years to stifle the exuberance of "rugged" individualists in industry. The unions have been riding high since about 1937—with time out for the war.

On that basis it may take as long as 10 more years to get labor to see that this is a cooperative world in which we live—if we are to steer clear of American-style dictatorships of one form or another.

Whether management's strong stand will hasten the retribution which always follows excesses remains to be seen. The laws and the politicians are stacked in favor of the unions in most cases. It is too early to see what throwing down the gauntlet will do.

Certainly it is worth a try. If management wins, everyone will benefit.

It will take dispassionate thinking to keep the cure from killing the patient. There stands management's responsibility.



Editor-in-Chief

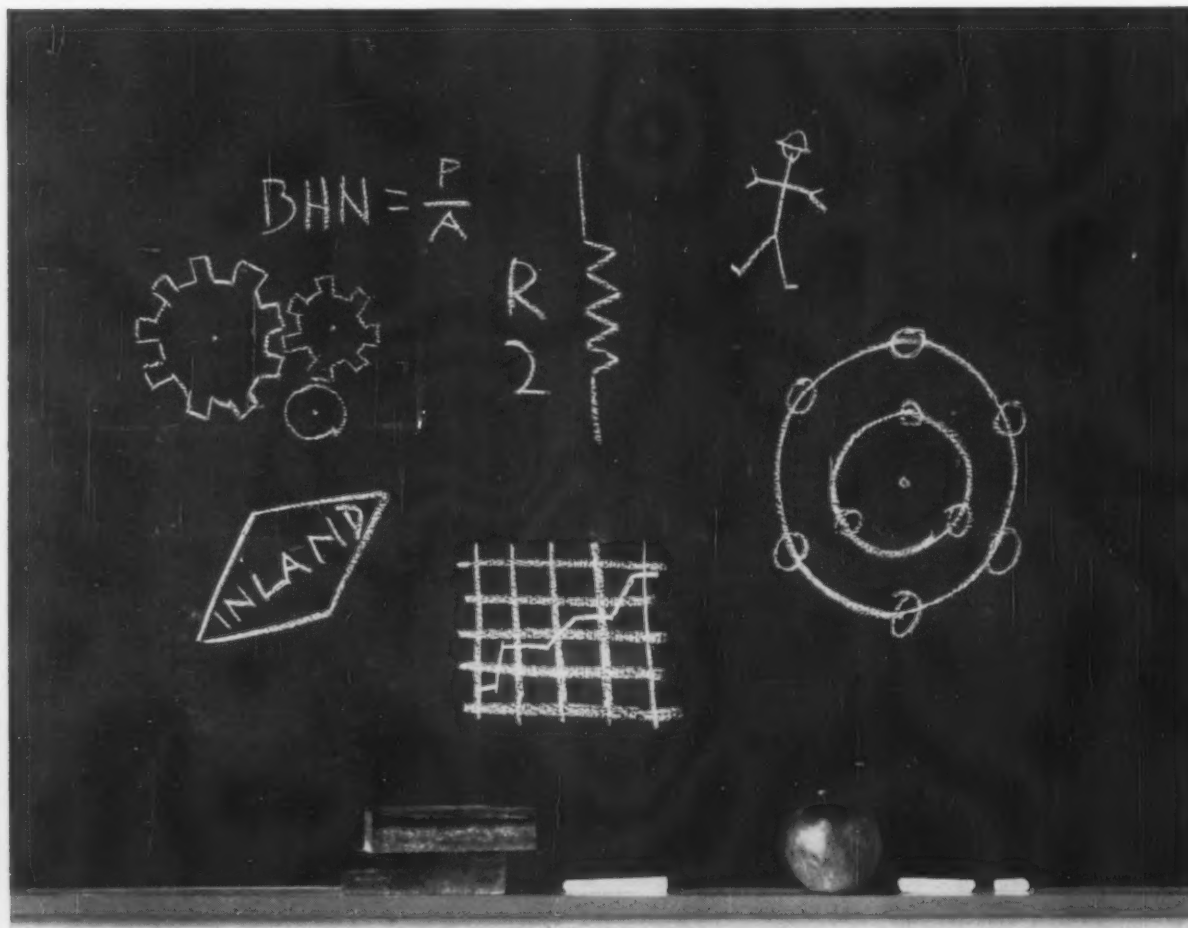
14,089 Inland employees went to school last year

Many went because they were enthusiastic about their jobs—inspired by the advancement opportunities at Inland. Others went because Inland, ever on the watch for men capable of developing their abilities, sought them out—found them—encouraged them to take the next step.

At Inland, this thoughtfully planned system of seeking for such men within the company, has now been in continuous operation for more than fifteen years. Because of it, more than 70% of Inland's supervisory staff have come up from the ranks—30% more from Inland's College Recruitment Program. Because the system encourages personal growth, the process never stops. It may begin with on-the-job training programs in which 3,842 employees participated last year. It can continue through Inland's programs in conjunction with leading educational institutions, such as Harvard, Purdue, University of Chicago and Wabash College.

With literally thousands of Inland men building their own futures, a new kind of climate is created—a climate in which men find real satisfactions in their work and the products of their labor. It results, we believe, in a growth-minded organization—a company dedicated to ever better service and products for every Inland Customer.

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Oriented Graphite

Oriented graphite can now be produced in commercial quantities. In the process, developed by Raytheon, the material is obtained from a carboniferous gas, and deposited molecule by molecule, on a substrate, with controlled orientation. Called Pyrographite, it should be particularly suitable where strength, impermeability to gases, and chemical inertness are required at high temperatures.

Cold Phosphatizing

Feature of new development in pre-paint phosphate processing is the temperature range in which it operates — 90°-110°F. Used for iron and steel products, this cold process is also automated. Amchem Products, Inc., developers of the process, claim that it delivers traceable and substantial heat savings.

Rare Metal Ups Resistance

Heat-resistant steel alloys for the space age can be improved by the addition of yttrium, report General Electric scientists. For example, a small amount of this rare metal, alloyed with AISI 446 stainless steel, raises oxidation resistance to 2500°F. Moreover, the alloy "is readily cold-rolled and easily welded."

Give Tools More Service

To meet foreign competition and also insure better operation, a special machine builder is about to offer manufacturers a service policy. This would provide preventive maintenance and expert service. Also furnished would be a quotation on parts most apt to require replacement.

Acts Like Platinum

Titanium, coated with platinum less than 0.0001-in. thick, can be made to act like a solid platinum anode. Crucible Steel believes that this

anode will find large-scale use in the chlorine-caustic industry. Present graphite anodes are consumable-type and are eaten away during cell operation. This causes expensive tear-down of cells, results in higher operating voltages and leads to contamination of the chlorine.

Work Magnetic Materials

A breakthrough in magnetic materials has lifted another metalworking barrier. Alnico 5, considered an unworkable, hard, brittle magnetic material, is now successfully fabricated into rod, wire and thin strip by hot working. Magnetic properties of the wrought materials are equivalent to cast properties. Mechanical properties are improved.

Compacts and Sinters

New powder metallurgy technique compacts and sinters in one operation. Key to the process is the explosive forming of the powder at a temperature above the metal's recrystallization temperature. Work on lead has produced shapes with improved mechanical properties.

Shell Molding Technique

A European shell molding technique calls for the use of salt patterns. One salt tried, melts at 284°C, is quite strong, and can be easily and accurately cast, states the report. The sand shell mold is set by heating to 200°C, after which water is used to dissolve out the salt pattern. It is reported that fairly complicated patterns such as a turbine blade and a twist drill have been cast.

Reduces Cable Stretch

For manipulators used to handling very delicate materials or radioactive materials, tolerance requirements are moving up rapidly. Use of an iron-cobalt-chrome alloy strip in one unit has cut stretch of the manipulating cables by 80 pct below that of wire, and cuts friction by a reported 90 pct, over a 10 ft cable length.

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CPA-10A (5-59)

LETTERS FROM READERS

Cost Analysis

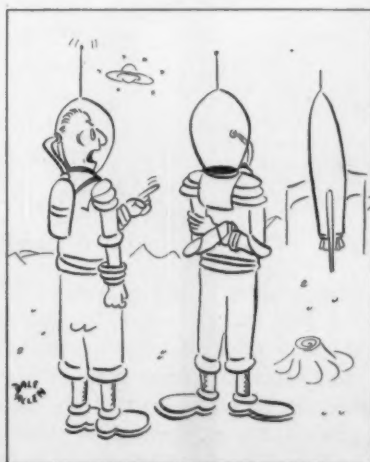
Sir—Will you kindly forward four reprints of the article in "Are Excessive Marketing Costs Draining Your Profits?" which appeared in the Nov. 5 issue.

I note that this is the first of a series of three articles on the subject of distribution cost analysis. Would it be possible with this one request to arrange for four reprints of each?—O. W. Sutro, Dir. of Sales & Marketing, Malleable Iron Fittings Co., Branford, Conn.

Sir—Please send the writer five copies of the article entitled "Are Excessive Marketing Costs Draining Your Profits?" which appeared in your Nov. issues.—Ernest Lieber, Market Analyst, Houdaille Industries, Inc., Buffalo, N. Y.

Sir—Would you send us six reprints of the article "Are Excessive Marketing Costs Draining Your Profits?" as well as six reprints each of the two subsequent articles that will appear on Nov. 12 and 19.—H. E. Rogers, Vice Pres.-Mfg., Hughes Tool Co., Houston, Texas.

Sir—I would appreciate three



"... and stop your sulking, professor."

copies of the article in the Nov. 12 issue on "How to Organize a Distribution Cost Analysis Program."—G. D. Dodge, Sales Dept., McLouth Steel Corp., Detroit, Mich.

■ **The third article in the series—"How to Bring High Marketing Costs in Line"—appeared last week in the Nov. 19 issue. Copies of this article, and the two preceding it, will be sent to readers requesting them.—Ed.**

Foreign Aid

Sir—I should like to compliment Editor-in-Chief Tom Campbell on his editorial subjects and his understanding presentation of these subjects.

Since our outlook seems to run

consistently parallel, perhaps you have given some consideration to educational foreign aid as a weapon against communism.

I understand Russia offers free education, not merely to Russians but foreigners as well, and also pays students according to their needs. What an effective weapon this must be for communist propaganda in such areas as India, China and Africa.

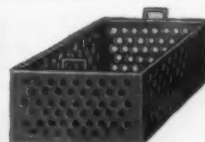
Why not become hosts and educators rather than the money lenders in the temple?—J. J. Jensen, Hamilton, Ontario, Can.

Pressure Spin

Sir—Will you give us the source for your Newsfront on "Spin Under Pressure" which appeared in the Oct. 15 issue.—L. E. Vachon, Girard Assoc., Chambersburg, Pa.

■ **For further information about this contact C. W. Torngren Co., Inc., Somerville, Mass.—Ed.**

Perforated Metal Products and Parts



Pickling Basket



Air Inlet Screen for Oil Burner

We, of course, supply manufacturers with perforated metal sheets and plates in a wide variety of sizes and shapes, from which they produce their own products and parts, but we are also fully equipped to relieve them of a great deal of this work. We weld, spot-weld, or rivet, stiffeners and

angles to the pieces and can form or flange them to special shapes as required. The items here shown are typical of hundreds we have furnished to other manufacturers during nearly a half century of successful experience.

YOU'LL SAVE MONEY in most cases, by placing orders with us for perforated metal parts, to be delivered in lots throughout the year in accordance with your production schedules. Specialized equipment and procedures will usually enable us to do the work at lower cost than it could be done in your own shops.

Send us your blue prints and specifications. When given sufficient information, our engineers are often able to make money-saving suggestions and always welcome an opportunity to do so.



Perforated Metal, spot-welded to specially formed angles.

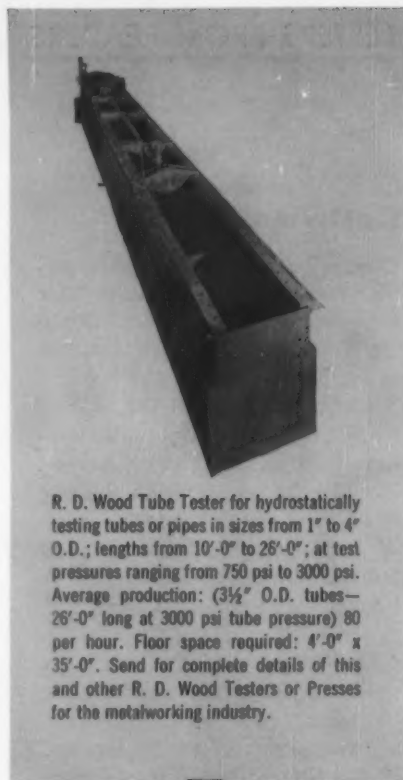
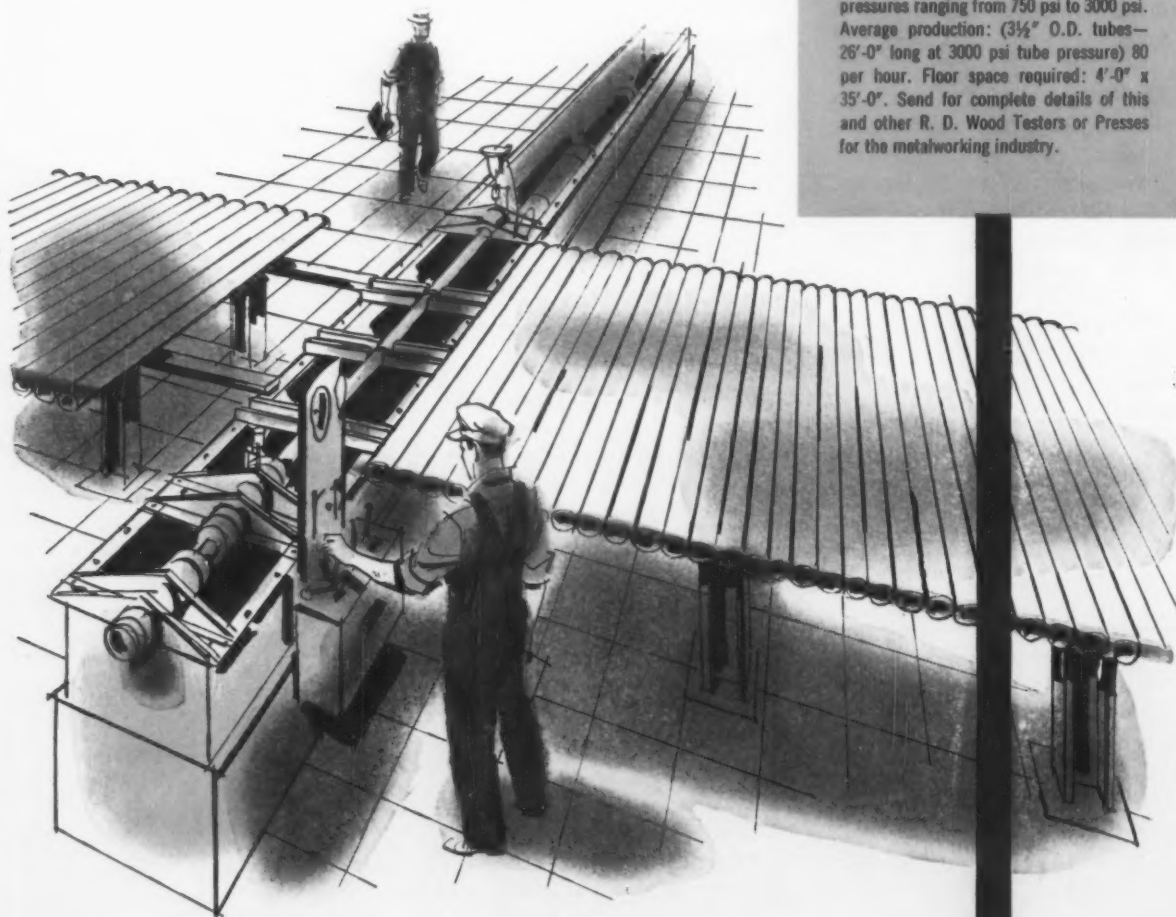
DIAMOND MANUFACTURING CO. WYOMING PENNA.

New Bulletin No. 51, Describes DIAMONTEX Perforated Metal Lay-In Panels for Modern Acoustical Ceilings.

Engineered for Performance

Put a Wood Tube Tester to work and get the money-saving advantages of smooth, dependable performance . . . long operation with low maintenance.

Reason: every Wood Tube Tester is the product of sound design, carefully selected materials, conscientious craftsmanship. This is why Wood Tube Testers and Presses are known throughout industry for their trouble-free operation and fast, economical production. R. D. Wood has many standard tube tester and press designs for a great variety of uses—and engineers others for special work. Write for our catalog and engineering information. No obligation, of course.



R. D. Wood Tube Tester for hydrostatically testing tubes or pipes in sizes from 1" to 4" O.D.; lengths from 10'-0" to 26'-0"; at test pressures ranging from 750 psi to 3000 psi. Average production: (3½" O.D. tubes—26'-0" long at 3000 psi tube pressure) 80 per hour. Floor space required: 4'-0" x 35'-0". Send for complete details of this and other R. D. Wood Testers or Presses for the metalworking industry.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

FATIGUE CRACKS

Strike Booklet

One of our men covering the strike noticed another reporter reading something familiar at a recent United Steelworkers meeting. It was a booklet just published by The IRON AGE on the 1959 Steel Strike.

Packed into its informative 128 pages are articles by Editor-in-Chief Tom Campbell and other IRON AGE staffers. Taken from the magazine, they review the situation from the end of the 1956 strike right up to the present.

Briefing From IA—What pleased our man at the meeting, however, was the interested reader. He was a reporter from one of the wire services. Sent out to cover the strike for the first time, he had been given The IRON AGE booklet for background reading.

Coming from another news source, we regard this as a worthwhile compliment on our own strike coverage.

Copies Available—In addition to leading newspaper, radio, and TV personnel, the booklet has been sent to members of the Senate and the House, and other officials in Washington.

IRON AGE readers who would like a copy can have one by writing on their company letterhead. We recommend the booklet as a thorough digest of history in the making.

Space Timetable

"In groping for the optimal conditions of a rocket's take-off for the moon, approximation methods may be used permitting us to consider the body's Keplerian motion relative to earth when the distance from the moon is more than 66,000 kilometers, and as Keplerian motion relative to the moon, when

this distance is less than 66,000 km."

This may be a little heavy for most of us to handle. But it apparently made a lot of sense to the thousands of engineers and scientists who packed the auditorium of the Sheraton Park Hotel in Washington last week to hear this, and lots more complicated sentences.

Hitting The Moon—The occasion: The annual meeting of the American Rocket Society. The speaker: Leonid I. Sedov, Russia's leading space expert. His talk was titled, "The Orbits of Cosmic Rockets Towards the Moon."

But there was no doubt that the young and polished Russian was telling his American competitors how to hit the moon. They were impressed.

But the three-man USSR delegation also couldn't fail to be impressed by some of the imaginative work on this side of the world.

Space Roadmap—For instance, a three-man team of scientists from Lockheed Missiles and Space Div.—Stanley Ross, Rollin W. Gillespie, and John V. Breakwell—presented "a combination timetable and celestial roadmap."

Said Lockheed, "The handy ready-reference chart makes it almost as easy to ascertain the basic requirements for a trip to Mars as it does to plan a cross-country bus trip."

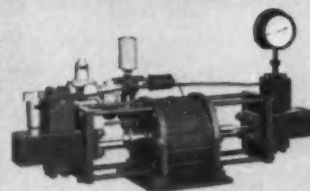
Travel Now or Later—Basically, the system uses a high speed computer to calculate all of the variables in such an undertaking.

Want to know how it works? Well, if you left August 1, 1960, you and a friend could make a round-trip to Mars, with a 10 day layover, in 740 days.

But, if you wait until 1967 you (and a friend) can make the same trip with a 40 day stopover, in just 735 days.

ALDRICH

AIR-DRIVEN HYDRAULIC PUMPS



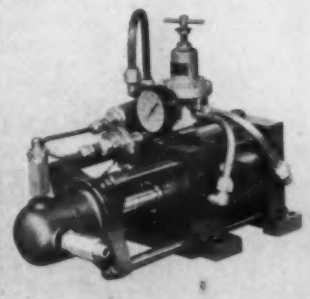
For production service: Heavy duty 6-inch stroke pump, single or double acting.

For production or laboratory . . . handling small volumes of fluid at pressures up to 50,000 psi.

For hydrostatic testing . . . tubing, valves and pressure vessels.

For operating hydraulic presses, cylinders and valve positioners.

Immediate shipment from factory stock.

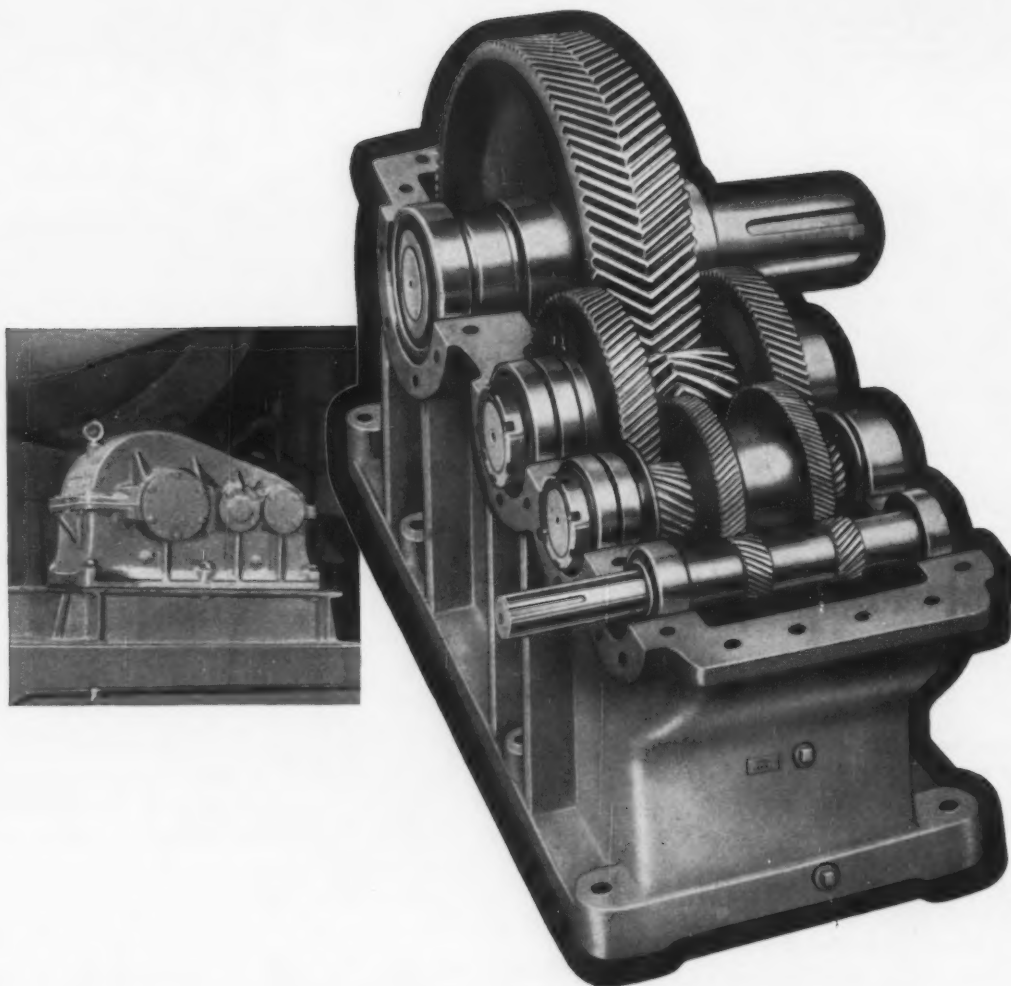


For intermittent service: 3-inch stroke pump has low first cost, high reliability.

Aldrich air-driven hydraulic pumps operate on normal plant air. They are compact, simple to install, economical to operate. Write today for Data Sheet 36 (6-inch stroke) or Data Sheet 36A (3-inch stroke).

ALDRICH

ALDRICH PUMP COMPANY
8 PINE STREET, ALLENTOWN, PA.



THE HEAVIER THE LOAD . . . THE MORE YOU NEED PHILADELPHIA HERRINGBONE REDUCERS

Heavy repeated shock loads . . . high horsepower . . . round-the-clock operation . . . put them together and you have the kind of a job where Philadelphia Herringbone Reducers perform best. They will last longer and save your maintenance dollars because extra strength is built into every part . . . housings, shafting, bearings and gearing.

To be specific:

Housings are specially reinforced at points of greatest stress. Extra heavy bearings take shocks and heavy overhung loads in stride. Result: shaft alignment is accurate . . . and it stays accurate. Gears, pinions and bearings last longer.

To meet the specific needs of each application, gearing is specially designed and symmetrically arranged

in the housing. Result: the bearings on each shaft carry equal loads, shaft deflections are minimized, bearings and gearing have higher shock load capacity.

Pound for pound, horsepower for horsepower and dollar for dollar, you can't buy a herringbone reducer that will outlast a Philadelphia. They are designed with *your* heavy duty drive problems in mind . . . so that you will never have a drive problem.

Philadelphia Herringbone Reducers are available in single, double and triple reduction for ratios of 1.75:1 to 292:1. Write today for your copy of Catalog H-55.

PHILADELPHIA GEAR CORPORATION
Erie Avenue and G Street • Philadelphia 34, Pennsylvania

philadelphia gear drives

Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.

INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

COMING EXHIBITS

Plant Maintenance & Engineering Show — Jan. 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Tool Show—April 21-28, Detroit Artillery Armory, Detroit. (American Society of Tool Engineers, 10700 Puritan, Detroit 38.)

Welding Show—April 25-29, Great Western Exhibit Center, Los Angeles. (American Welding Society, Inc., 33 West 39th St., New York 18.)

Southwestern Metal Show — May 9-13, State Fair Park, Automobile Bldg., Dallas, Texas. (American Society for Metals, Metals Park, Novelty, O.)

Design Engineering Show — May 23-26, Coliseum, New York. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Production Engineering Show—Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Machine Tool Show—Sept. 6-16, International Amphitheatre, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

MEETINGS

NOVEMBER

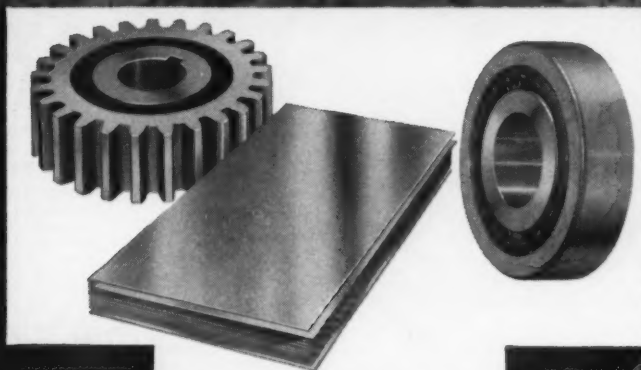
The American Society of Mechanical Engineers — Annual meeting, Nov. 29-Dec. 4, Chalfonte Haddon Hall, Atlantic City, N. J. Society headquarters, 29 W. 39th St., New York.

American Institute of Steel Construction, Inc. — Annual convention, Nov. 30-Dec. 3, The Boca Raton Hotel & Club, Boca Raton, Fla. Institute headquarters, 101 Park Ave., New York.

(Continued on P. 16)

VALVOLINE
Tectyl

protects metals
against **RUST**



VALVOLINE's amazing Tectyl rust preventives protect metal surfaces against every kind of rust and corrosion during storage and shipping.

Low-cost Tectyl compounds are easy to apply by brush, spray or dip and just as easy to remove. They protect metal surfaces against . . . sun and rain . . . heat and cold . . . salt air and salt water . . . humidity, perspiration and corrosive fumes.

Tectyl rust preventives meet exacting government specifications.

Write today for these
two helpful Tectyl charts

1. "Valvoline Tectyl U. S. Government Approved Packaging and Preservative Chart." Gives the Army, Navy and Air Force "Specs" and applications.

2. "Valvoline Tectyl Industrial Rust Preventive Comparison Chart." Specifies applications covering the entire field.

VALVOLINE
Tectyl ALL-METAL PROTECTION
RUST PREVENTIVES

VALVOLINE OIL COMPANY, Freedom, Pennsylvania
Division of Ashland Oil & Refining Company



BEFORE BRUSHING

Close-up of leaded steel cog roller shows burrs... heat-treat scale... sharp edges. Off-hand finishing time: 2 minutes.



AFTER BRUSHING

Burrs and scale completely removed... all edges and grooves uniformly blended. Osborn 3-A Finishing Machine cycle time—including handling time: 40 seconds.

Phone parts finished at 90-an-hour clip ...superior quality 3 times faster with OSBORN Power Brushing



TELEPHONE SWITCH PARTS are automatically finished to exacting specifications. This efficient Osborn 3-A Metal Finishing Machine—using Osborn Monitor Brushes—deburs and finishes lots of 2000 to 4000 parts better and 3 times faster than former method.

These are cog rollers—vital parts of telephone switches made by a leading manufacturer of electronic and communications equipment. Properly finishing these components means thorough deburring plus removal of heat-treat scale and sharp edges.

Hand scraping and off-hand methods were slow—took 2 minutes per part—rejection rate was high and costly.

Today, an Osborn 3-A Metal Finishing Machine does the job 3 times as fast—just 40 seconds per part including handling time—and saves 2000 hours a year on this one part alone. *Plus values:* high, uniform quality... rejects eliminated.

This Osborn finishing application is typical of how you can pinpoint savings, too. An **Osborn Brushing Analysis**—made in your plant now at no cost or obligation—is the first step. Write us for full details. *The Osborn Manufacturing Company, Dept. F-89, Cleveland 14, Ohio.*



METAL FINISHING MACHINES... AND FINISHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

MEETINGS

(Continued from P. 15)

DECEMBER

Electric Overhead Crane Institute—Annual meeting, Dec. 2, Carlton House, Pittsburgh. Institute headquarters, One Thomas Circle Washington 5, D. C.

Electric Furnace Steel Committee—17th Annual conference, Dec. 2-4, Hotel Cleveland, Cleveland. Committee headquarters, 29 W. 39th St., New York.

Electronic Industries Assn.—Quarterly meeting, Dec. 2-4, Statler Hilton, Los Angeles, Calif. Association headquarters, 1721 DeSales St., N. W., Washington, D. C.

National Assn. of Manufacturers—Annual meeting, Dec. 2-4, Waldorf-Astoria, New York. Association headquarters, 2 East 48th St., New York.

National Warm Air Heating & Air Conditioning Assn.—Meeting, Dec. 2-4, Chase Park Plaza Hotels, St. Louis, Mo. Association headquarters, 640 Engineers Bldg., Cleveland.

Material Handling Institute, Inc.—Annual meeting, Dec. 13-16, Savoy-Hilton Hotel, New York. Information: Hanson & Shea Inc., One Gateway Center, Pittsburgh 22, Pa.

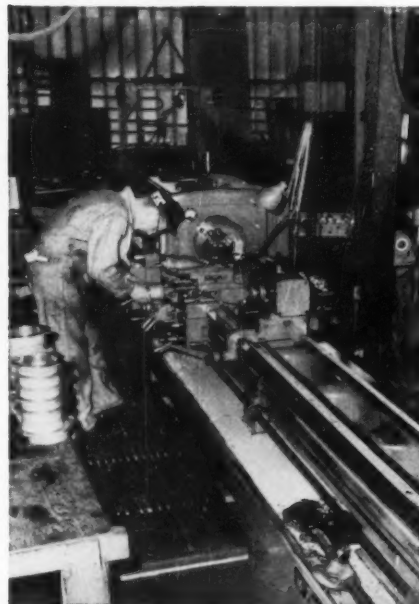
JANUARY

Society of Plastics Engineers, Inc.—Annual technical conference, Jan. 12-15, Conrad Hilton Hotel, Chicago. Society headquarters, 65 Prospect St., Stamford, Conn.

Assn. of Steel Distributors, Inc.—Convention, Jan. 30-Feb. 6, El Mirador Hotel, Palm Springs, Calif. Association headquarters, 29 Broadway, New York 6, N. Y.

American Institute of Electrical Engineers—Winter general meeting, Jan. 31-Feb. 5, Hotel Statler, New York. Institute headquarters, 33 W. 39th St., New York 18, N. Y.

Here, a slip joint collar is being turned and bored from a T-6 aluminum blank. Floor-to-floor time is only 25 minutes, a 30% saving in time alone.



even an engine lathe
can have an impressive record of savings
if it's a **LODGE & SHIPLEY POWERTURN**
records show \$2000.00 annual saving . . .
30% on a typical operation

Significant savings are nothing new on production type lathes but it is something to write home about on an engine lathe. Tacoma Boatbuilding Co., Inc., Tacoma, Washington, liked the accuracy, versatility and output of their POWERTURN Lathe . . . found impressive savings even when this engine lathe was used for non-repetitive operations.

Whatever your turning requirements, consider Lodge & Shipley. Your needs can be filled precisely from a complete range of sizes and types . . . Production, Engine, Tool-maker, Gap, Hydraulic Tracer Controlled and Right Angle Chucking Lathes . . . all designed to provide the best machine for a specific job.

Check Sweet's Machine Tool File, your telephone book Yellow Pages or write direct for literature: The Lodge & Shipley Company, 3073 Colerain Ave., Cincinnati 25, Ohio.

Your Lodge-ical choice . . .

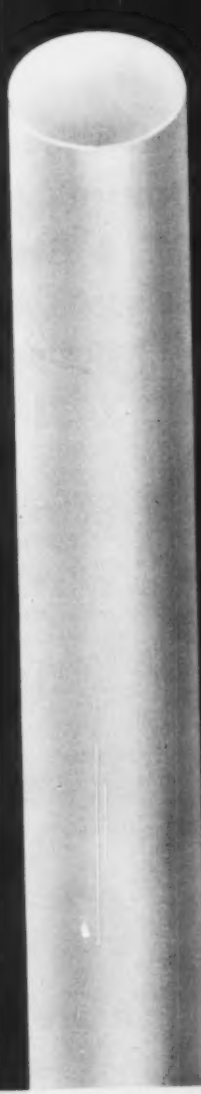
Lodge & Shipley

DID
YOU
HEAR?

BRIDGEPORT
MAKES
BOTH

BRASS

AND
ALUMINUM



SCREW MACHINE ROD

BUY BRIDGEPORT SCREW MACHINE ROD

Bridgeport has no "metal axe" to grind. We recognize that for some applications aluminum is better...for others, brass is best. Our one objective is *to give you the most suitable material for your specific needs.* That's why you can always rely on the advice of your Bridgeport Salesman—he knows your screw machine needs and can give you the same high quality rod in aluminum or brass. He's backed by our 92 years of metals know-how and our pioneering work in developing high speed rods for the screw machine industry.

He can give fast service, too, because Bridgeport stocks both aluminum and brass screw machine rod in warehouses and mills throughout the country for immediate delivery. For full details, call your nearest Bridgeport Sales Office, or, write directly to Bridgeport Brass Co., Bridgeport 2, Conn. Dept. BA371

ALUMINUM SCREW MACHINE ROD

TYPES	Round and Hexagon.
SIZES	Diameters in 1/64" increments from 1/2" to 3" in standard 12-foot lengths.
ALLOYS	2011-T3 (Standard temper—heat treated and drawn) 2011-T8 (For applications requiring deep drilling—HT-Drawn-Aged) 2017-T4 (For applications requiring high strength) 6061-T6 (For applications requiring superior corrosion resistance) 2024-T4 (Heat treatable—for applications requiring high strength)

BRASS SCREW MACHINE ROD

TYPES	Round, half-round, oval, square, rectangular, hexagonal and special shapes.
SIZES	Diameters from 1/16" through 4-1/2".
ALLOYS	Free Cutting Brass; Leaded Commercial Bronze; Tellurium Copper; Sulphur Bearing Copper; Hardware Bronze; Leaded Muntz Metal; Leaded Naval Brass; Aluminum Bronze; Free Cutting Phosphor Bronze; Nickel Silver.

BRIDGEPORT TECHNICAL SERVICE is always ready to help you use metals to your best advantage—in reducing costs, improving alloys or solving your production problems on both brass and aluminum. Ask your Bridgeport Salesman or write to us direct for more details.



BRIDGEPORT BRASS COMPANY

Bridgeport 2, Conn. • Sales Offices in Principal Cities
Specialists in Metals from Aluminum to Zirconium

No cleaning job too tough for Wheelabrator®

This mammoth casting, for example. Cleaning with manual methods required days of labor. But Wheelabrator airless abrasive blast cleaning reduced the job to minutes besides improving cleaning quality and effecting impressive savings in overall cleaning costs. Wheelabrator has no peer in the number and range of cleaning problems solved nor in the ingenuity with which equipment has been designed and engineered. Here you have at your disposal the richest background of practical cost-saving ideas in the blast cleaning industry.

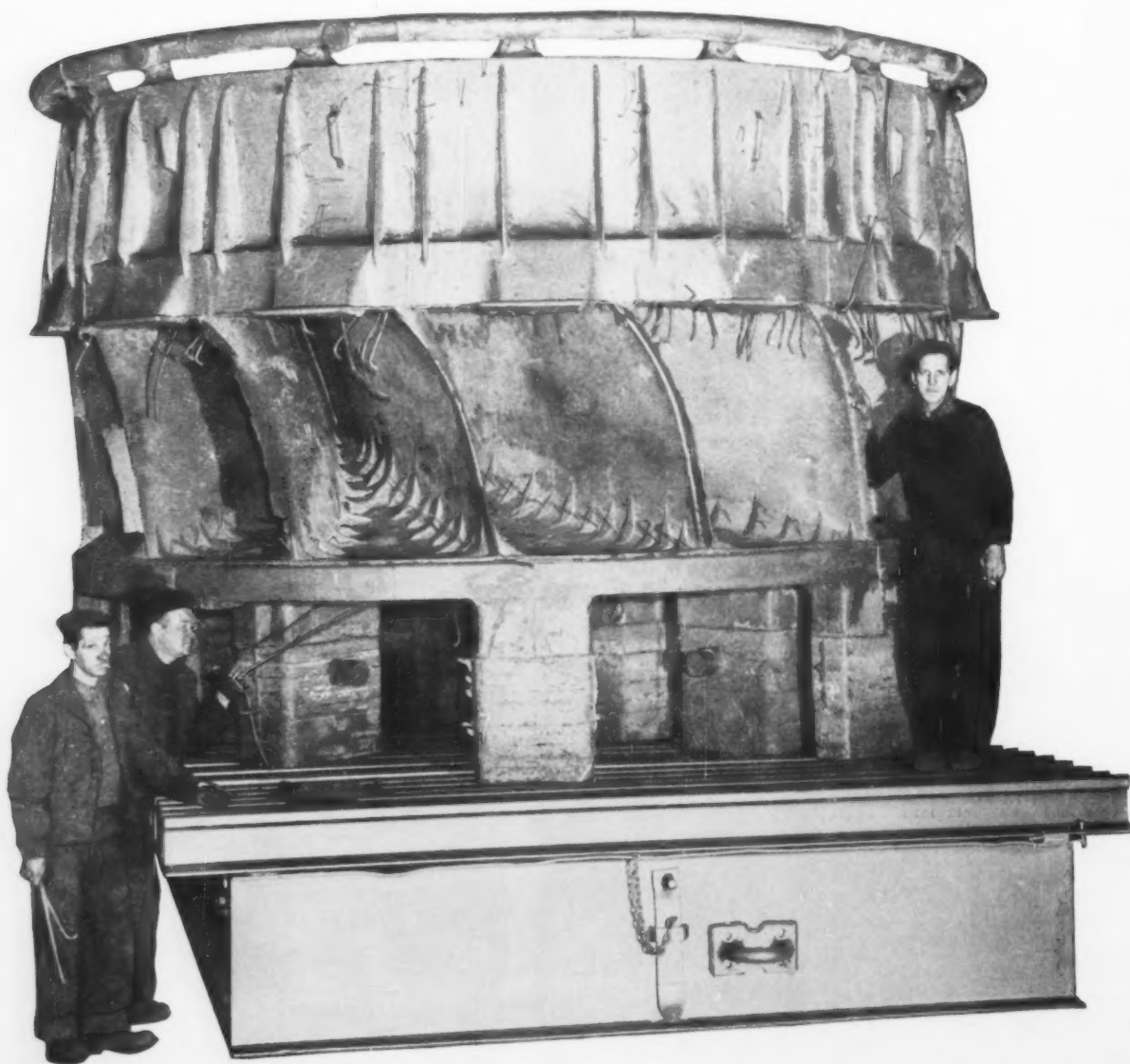


Write for our 40-page manual of special cleaning problems solved by Wheelabrator cabinets. Ask for Catalog 105-D.

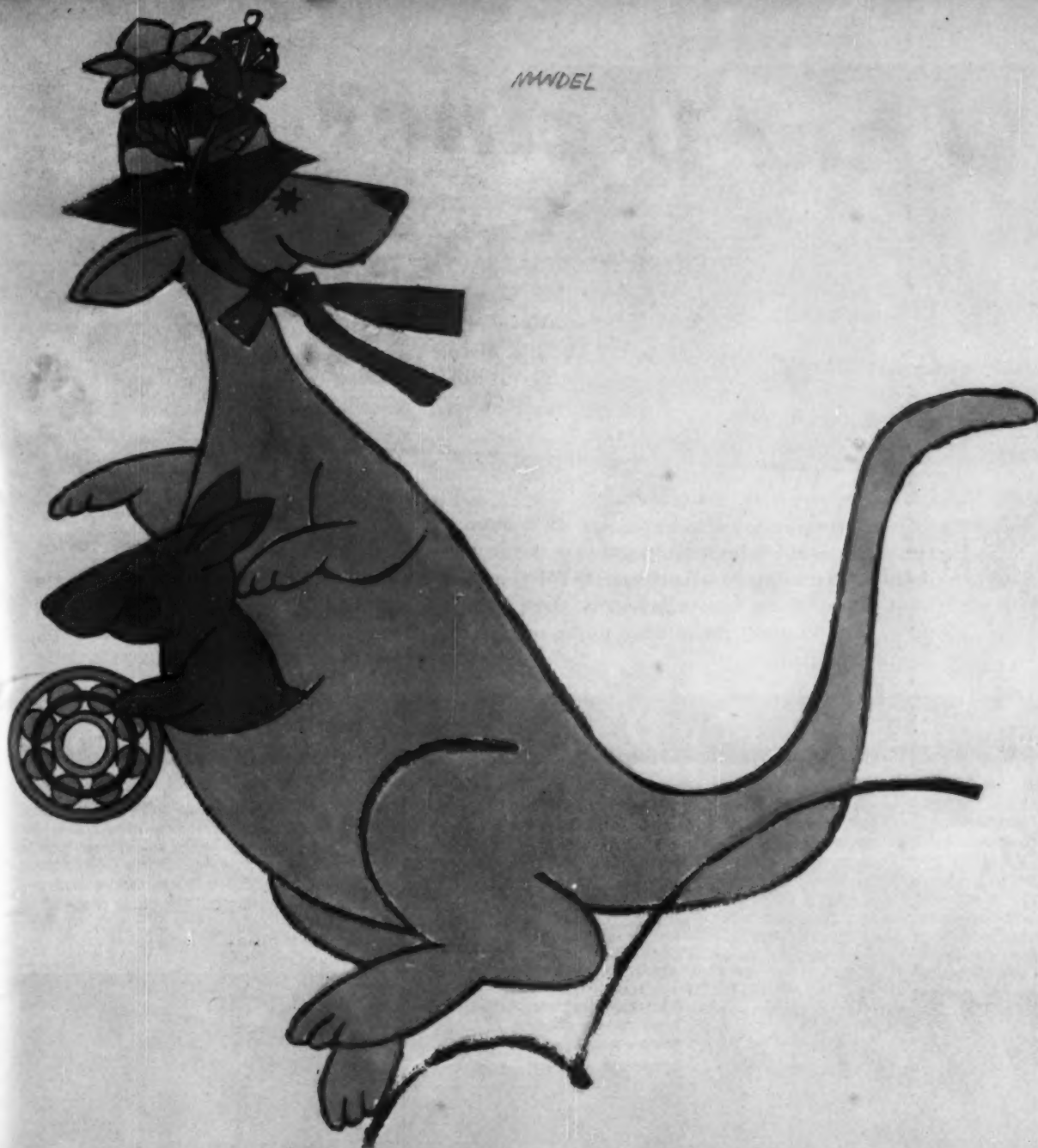
WHEELABRATOR
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510 Byrkit St., Mishawaka, Ind.
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*World's largest manufacturers of airless
blast equipment and steel abrasives.*



MMWDEL



HIGHER SPEEDS

The raceway of a Federal Ball Bearing is designed to do just what its name implies—provide a track around which balls can whirl at lightning speeds, without fatigue. To make sure they do, every Federal Bearing starts with tough SAE 52100 steel. Scores of production and quality control steps later, a perfect ball bearing emerges, primed to perform its high speed tasks.

Smoothly. Quietly. Efficiently. And where do we send these smooth, quiet, efficient bearings? Our customer list is a veritable who's who of American industry. We'd like to include your name, too. Our catalog lists over 12,000 ball bearing sizes and hundreds of types. Send for it today.

THE FEDERAL BEARINGS CO., INC., Poughkeepsie, N. Y.

Federal

BALL BEARINGS



One of America's
largest ball bearing
manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

What is zinc?

zinc (zink, *n.* [G. *zink*, prob. akin to *zinn* tin: cf. F. *zinc*, fr. G. Cf. TIN.] 1. *Chem.* A bluish white crystalline metallic element, brittle when cold, malleable at 120-150° C. (250-300° F.), and very brittle at 200° C. It is practically unaffected by air and moisture at ordinary temperatures. Symbol, *Zn*; at. wt., 65.37. Zinc melts at 420° C. (788° F.). At about 930° C. it boils, yielding vapors which burn in air, forming the oxide. Sp. gr. of zinc, 7.72. Weight of a cubic foot, 437-450 lbs.

In commerce there is a lot more to zinc than this simple definition. First, there are 6 different ASTM Specifications. Then, within various industries, there are innumerable "Custom" grades made to the consumer's own specifications.

Thus, the most important factor in Zinc Production is St. Joe's metallurgical control.

HERE IS HOW IT'S DONE AT OUR JOSEPH TOWN,

This is the final production stage of St. Joe Electrothermic zinc — a continuous vacuum-type condenser. There are eleven of them, each serving a casting bench. These furnaces are tapped every 20 minutes and from each, 1400 lbs. of zinc, perhaps part of your order, flows into the ladle. The operator using a small hand ladle casts two samples (insert shows samples approx. 1/5 actual size) and sends them via a Lamson Airtube System to . . .

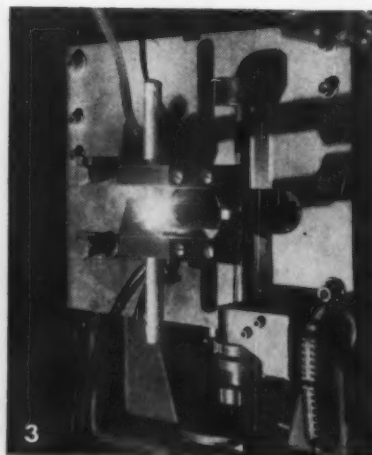
. . . the Baird Direct Reading Spectrometer Lab. There the samples' sprues are removed, the ends chamfered and automatically machined to precise dimensions; they are now test electrodes 3" long that look like this:



Extremely high voltage creates an arc across the electrodes. As elements are vaporized, light from the arc is broken into element lines of varying light energy. This energy, directed to photomultipliers (photo-sensitive electronic tubes), is converted to electrical energy which actuates . . .



A lab technician places the two samples in the Spectrometer's electrode holders, closes the door and merely pushes a button.



ST. JOSEPH LEAD COMPANY

ST. JOE

250 PARK AVENUE
NEW YORK 17, N. Y.

ZN-126

St. Joe can practically guarantee that once we have "tailor-made" a metal to your own specifications, we can supply you with carload after carload of zinc, unchanging in analysis. This *consistent* control of grade is one of several reasons why the records of our shipments of zinc to continuous galvanizers reads like a "Who's Who" of that industry.

WE ACCOMPLISH THIS BY A METHOD OF HIGH-SPEED ZINC ANALYSIS

Using a Baird-Atomic Direct Reading Spectrometer, St. Joe HAS SLASHED ANALYSIS TIME TO LESS THAN 10 MINUTES . . . WITH A COMPLETE QUANTITATIVE REPORT ON 10 ELEMENTS!



When critical alloying specifications are being maintained on continuous slab casting, a sample analysis can be taken from each tap and composition confirmed *before* the zinc becomes too cold to pour.



PA., ZINC SMELTER

. . . pre-calibrated dials that indicate elements directly IN PERCENT-AGES! In five minutes the zinc sample can be completely analyzed for iron, lead, cadmium, copper, aluminum, indium, tin, antimony, silicon and magnesium. Two minutes later by return tube . . .



. . . casting room operators have the complete analysis. They know whether or not critical specifications are being maintained. **TOTAL ELAPSED TIME FROM COLLECTION OF SAMPLE TO COMPOSITION REPORT — LESS THAN 10 MINUTES!**



ST. JOE Electro-Thermic ZINC

HIGH GRADE
INTERMEDIATE

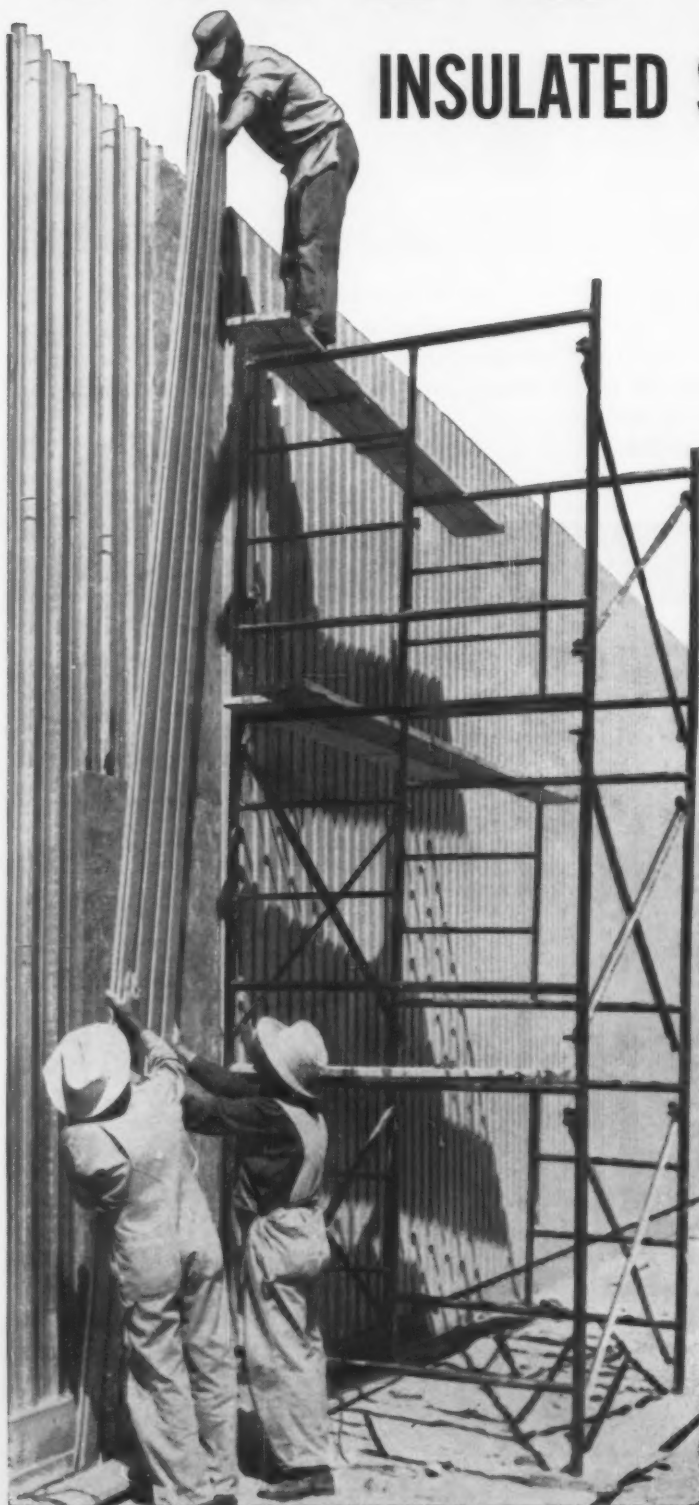
BRASS SPECIAL
PRIME WESTERN

TRUSCON

INSULATED SIDEWALL PANELS

GO UP EASY...

GO UP FAST...



Truscon Insulated Steel Sidewall Panels combine versatility in design and construction for lowest installation and maintenance costs. Easy to apply, economical, architecturally beautiful. Available for immediate delivery.

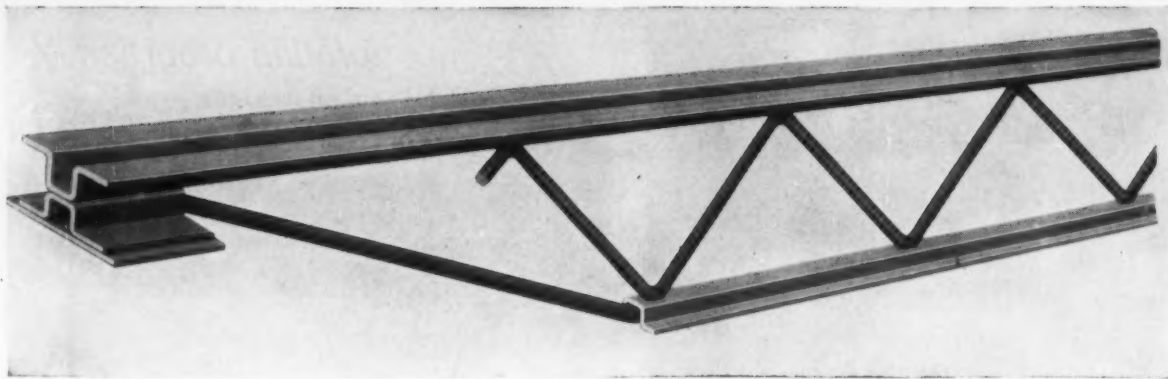
Truscon Panels are constructed by sandwiching a layer of insulating material between two sheets of Truscon 24" FERROBORD® or galvanized ribbed sheeting. Panels are securely interlocked and button punched for maximum weather-tightness.

Results: An exceptionally low-cost insulated wall completely fabricated during erection in the field. Panels are furnished, painted, or galvanized, in widths of 2'-0", and up to 40'-0" in length. Painted or galvanized exterior and interior require very little maintenance.

The long lengths available in Truscon facing panels and the absence of horizontal joints assure savings in erection time, and a neat, trim surface. Interlocking side joints blend with the fluted design of the panel and provide a pleasing, classic appearance.

To learn more about Truscon Insulated Sidewall Panels call your Republic-Truscon representative. Or, write direct.

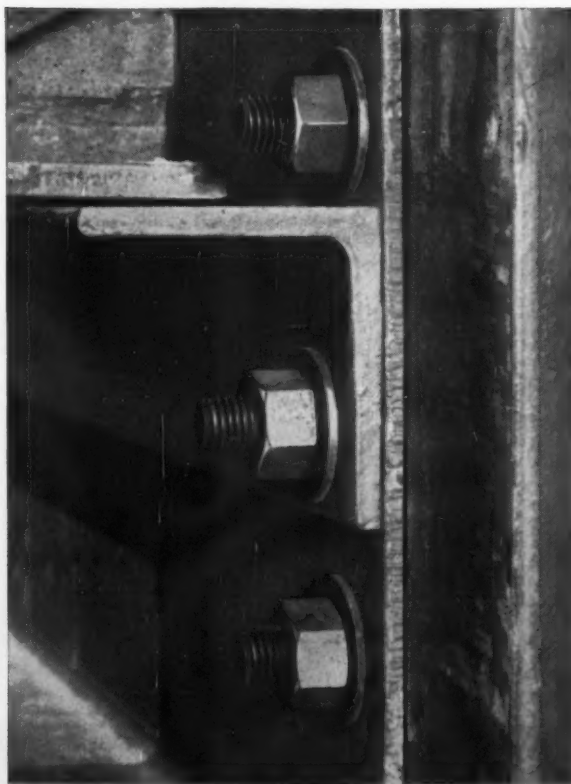
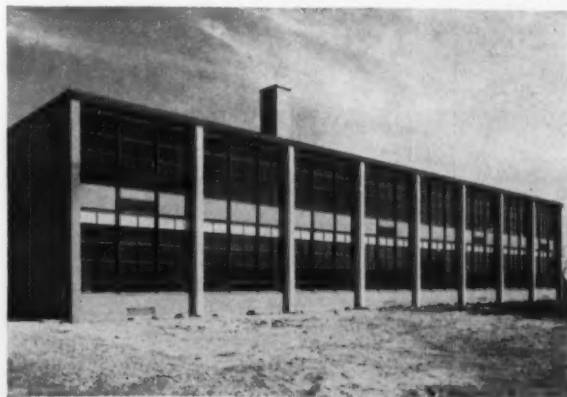
KNOP Television Station, North Platte, Nebraska
North Platte Television, Inc.
Architects: Hinde & Laurinat



TRUSCON "O-T" OPEN TRUSS® STEEL JOIST now designed and engineered to 20,000 psi working stress. Stronger, balances with other structural components. Produced in longer 40- to 48-foot range. Send coupon for complete information.

REPUBLIC HIGH STRENGTH BOLTS provide strong, safe connections. High clamping force transfers loads to structural members by friction alone—an advantage that only high strength bolting provides. Installation easy, quick, economical. Write today.

TRUSCON VISION-VENT WINDOW WALL construction added to the beauty, lowered the cost of the Trenton School, Cincinnati, Ohio. Erection is fast because VISION-VENT is a wall with the window already in place. Architect: Joseph Stith. Send coupon below.



REPUBLIC STEEL



*World's Widest Range
of Standard Steels and
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1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send the following additional information:

- ☐ Truscon Curtain Wall
- ☐ "O-T" Open Truss Steel Joist
- ☐ Truscon Vision-Vent Window Walls
- ☐ High Strength Bolts

Name _____ Title _____

Firm _____

Address _____

City _____ Zone _____ State _____

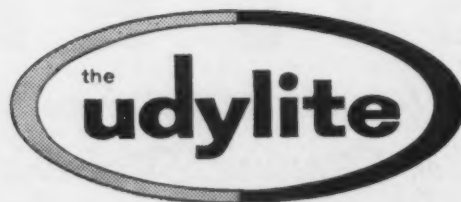
*plating progress **




THE UDYLITE SUPPLY NETWORK



world's largest plating supplier



corporation
detroit 11, michigan



Telephone, teletype and cable, a globe-circling network of depots, the speed of jet-age transportation are all at your command when you order plating supplies from Udylite. The supplies service team comprising a large and intricate complex of communications, warehousing, and personnel is set in motion with the receipt of your order. What you *get* is the finest quality, the newest exclusive processes, in the most advanced packaging available, delivered with exactness, and speed. Within twenty-four hours—even less if necessary—your order can be on its way to you from the nearest point of availability. In time to keep your production line moving you receive your Udylite supplies, of quality, weight and price you know you can depend upon. This is indeed “worry-free” buying provided for you by Udylite.

MEANS WORRY-FREE BUYING FOR YOU
...helps guarantee your production quotas



Not customary but entirely “in order” is this shipment, rushed by Udylite messenger directly to planeside in Detroit for emergency delivery to a customer in Johannesburg, South Africa. The delivery was made in just 39 hours at a distance of 9036 miles in time to avert a production halt and provide the customer with typical Udylite supply service satisfaction. Udylite special delivery joins with the world’s speediest common carriers to deliver your order tomorrow, if that’s how fast you need it.

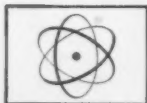
SPS RELIABILITY

A dynamic standard of predictable performance



SPS Nuclear Division inspector in foreground verifies 12 in. OD of reactor vessel core access housing. Tolerance: $\pm .001$ inch. Precision granite surface plate assures absolutely level test bed, eliminates slightest distortion of jigs. Typical reactor vessel closure head incorporates some 50 of these large precision-machined housings—for control rods, instrument packages and access.

No random sampling here . . .



Parts reaching this final inspection area at the SPS Nuclear Components Division are already documented by detailed records of their dimensions. Presumably they are perfect. Yet to be certain, the records are put aside and every dimension of every part is checked and recorded again—and then cross-checked against the original figures. With a part such as the large core access housing in the foreground, this involves over 200 measurements, many to $\pm .0005$ inch.

To make these checks, SPS technicians draw on more than \$3 million worth of precision gaging, including the very latest air and electronic equipment. Most of this is of the comparator

type, designed to eliminate possible misreadings, which sometimes occur with vernier scales.

Why this emphasis on perfection? Simply because these parts must function with 100% reliability in locations that are often made inaccessible by radiation. If you have requirements for such components (for reactors or for conventional power-producing machinery), contact SPS—manufacturer of precision threaded fasteners and allied products in many metals, including titanium. Request new Folder 2499.

NUCLEAR COMPONENTS Division SPS

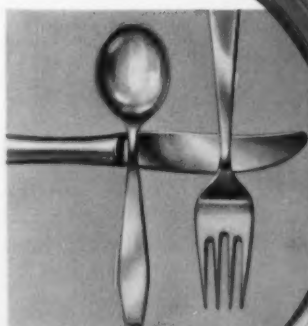
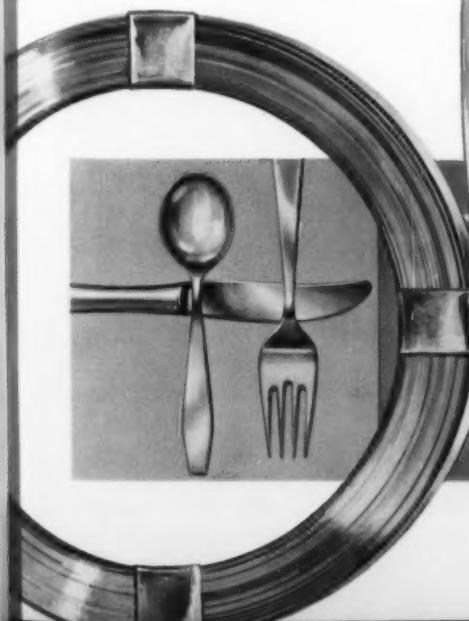
JENKINTOWN 17, PENNSYLVANIA

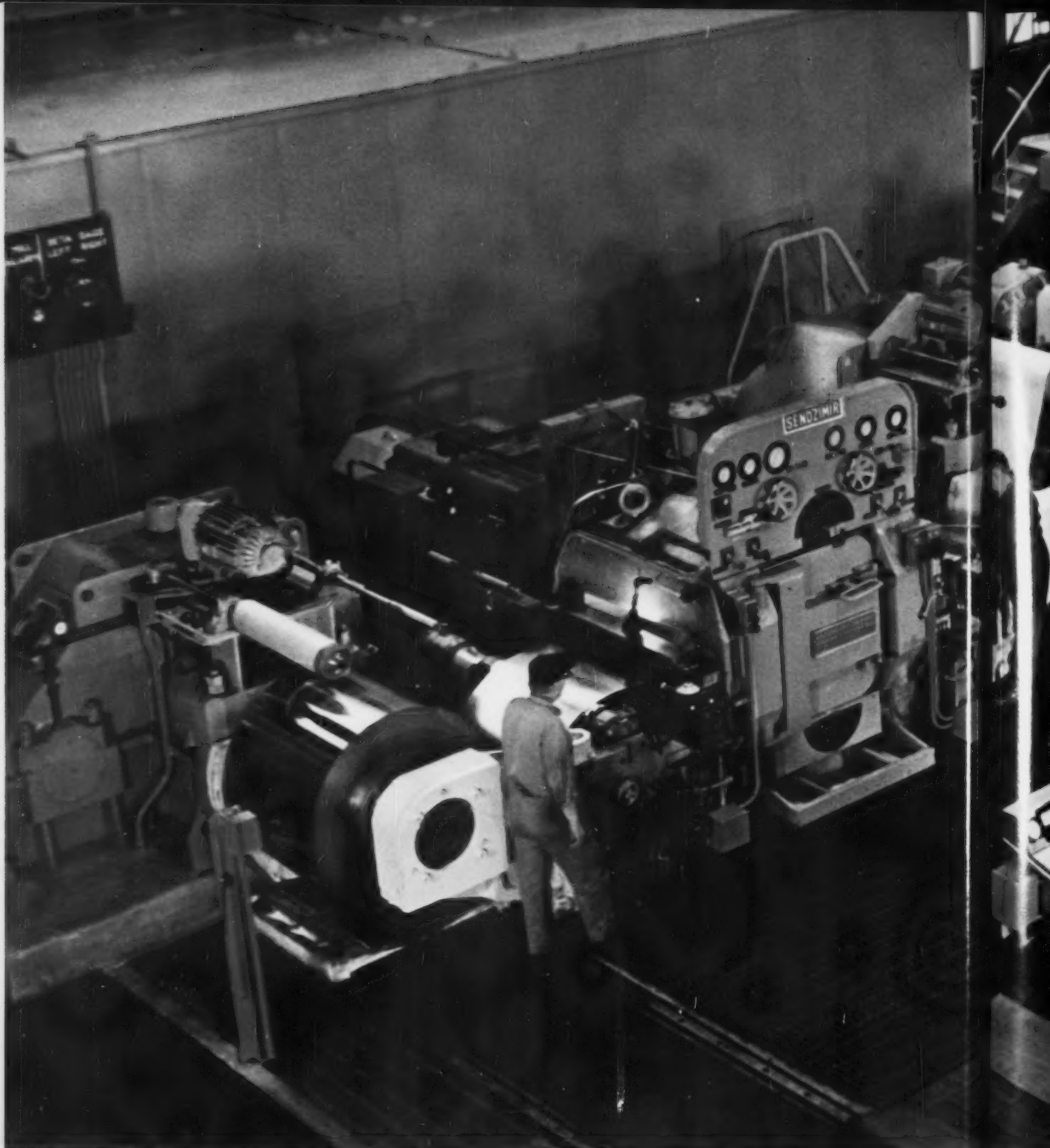
THE IRON AGE, November 26, 1959



**The stainless steel strip
you see here
is as thin as the
paper in your hand**

New American Steel & Wire
Sendzimir Mill rolls stainless steel strip
as thin as .005
with uniform gauge and quality
throughout entire coil



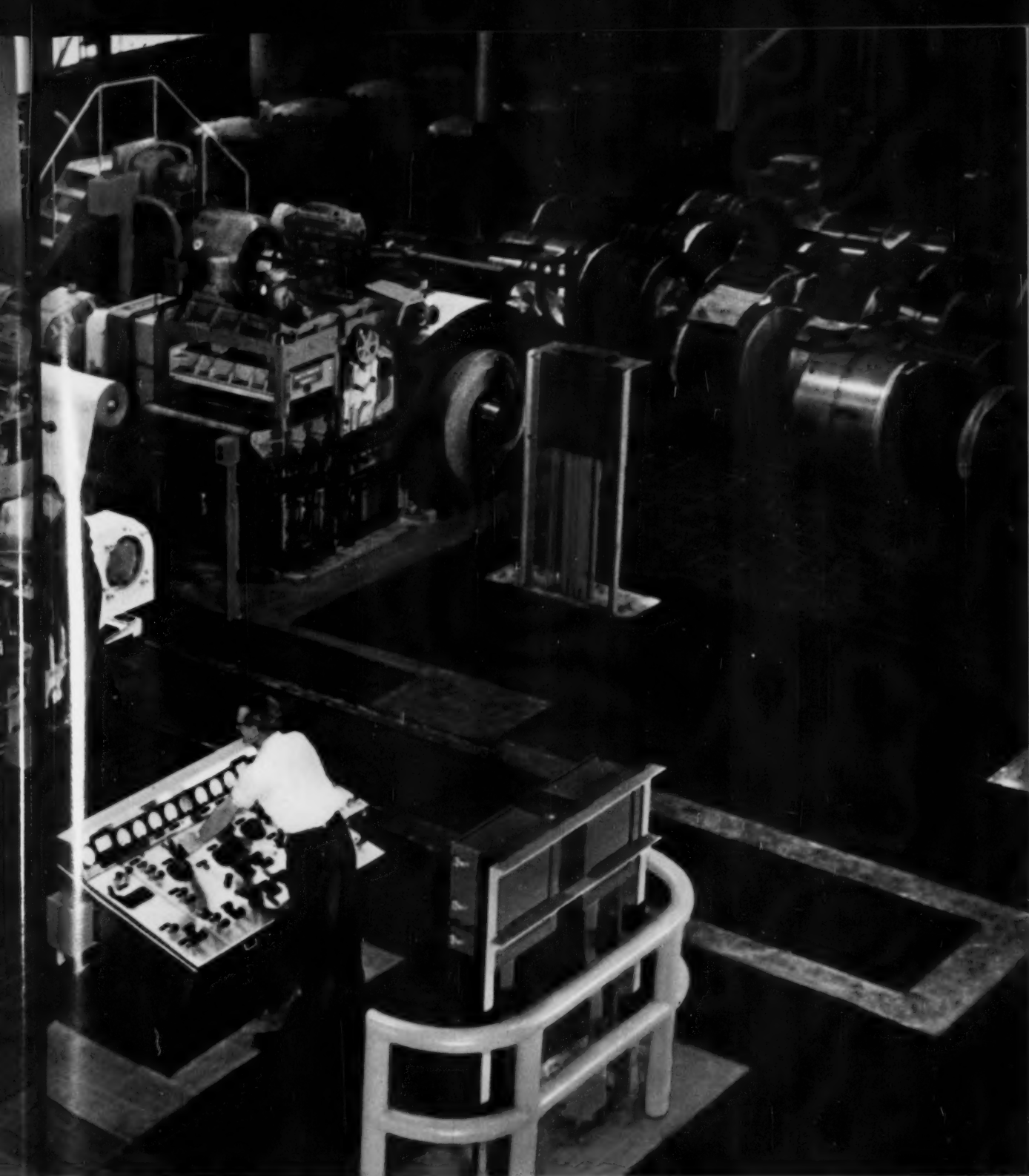


This new Sendzimir Mill . . .

the first of its kind in the Cleveland area—is now in operation at American Steel & Wire's Cuyahoga Works, producing ultra-thin gauges of high luster stainless strip at very close tolerances. This 37-inch "Z" mill will accept strip 0.150 inch thick and will reduce it as thin as 0.005 inch.

The very latest non-contact precision gauges continuously measure and automatically control the thickness of the steel and assure uniformity throughout the entire coil. A radio-active source is used to emit beta rays which measure strip in the 0.005" to 0.028" range. Other beta rays, converted to gamma rays, gauge the strip thickness

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above 0.028". It is the continuous operation of these controls which assures the absolute uniform thickness of the finished coil of strip.

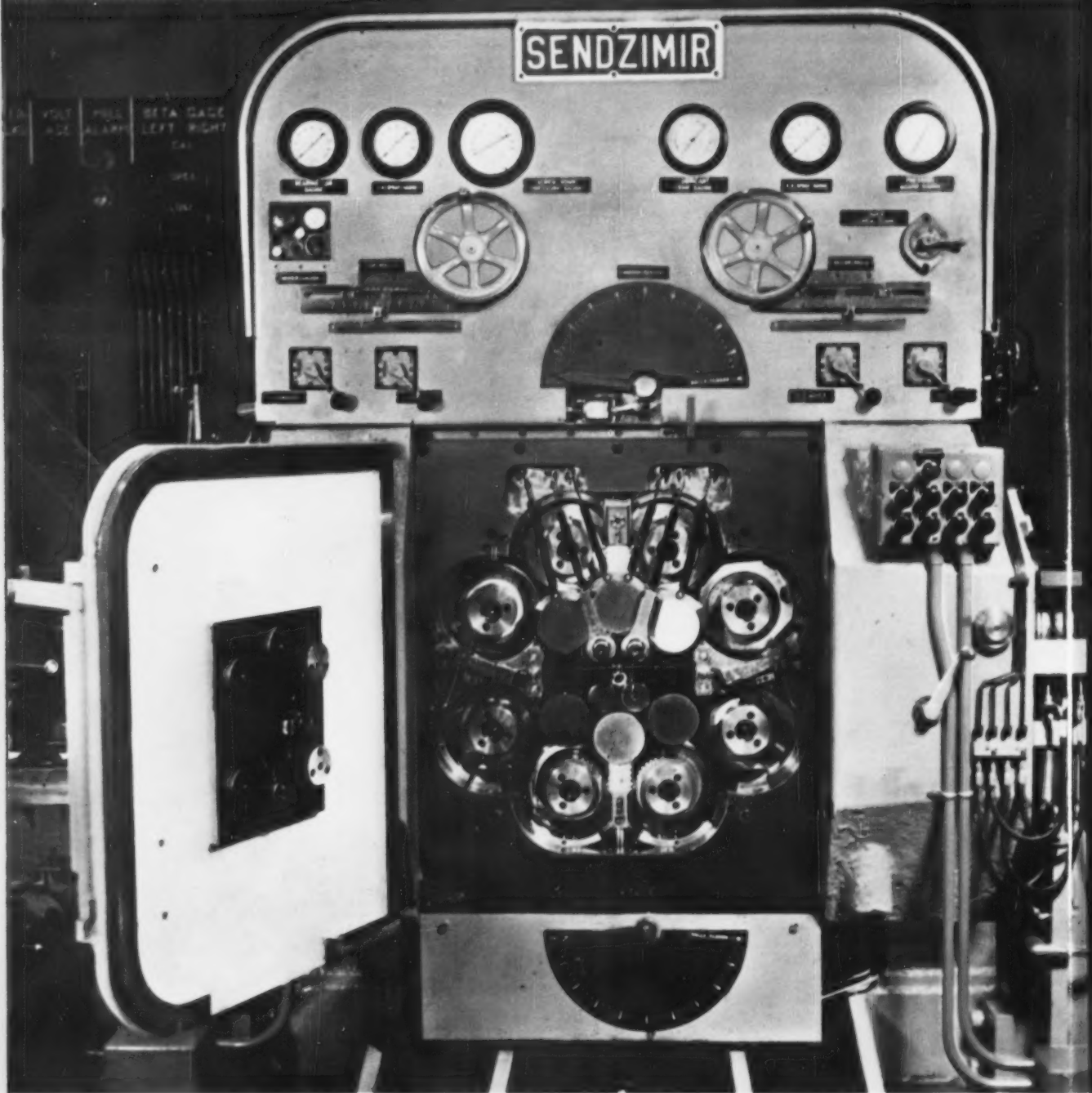
The "top drawer" treatment of stainless steel strip doesn't stop with the new "Z" mill. Improved welding, annealing and pickling lines, plus new surface conditioning units are all part of American Steel & Wire's program to produce top-quality stainless strip. Continuous paper interleaving during the entire manufacturing cycle is an added precaution to protect the finish.

USS is a registered trademark

American Steel & Wire Division of United States Steel



Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad



In this close-up you see the real "heart" of the Sendzimir Mill. In the center of the roll assembly are two highly polished small diameter work rolls. Five back-up rolls and 4 back-up bearing shafts supply the driving power and control the pressure for each of the work rolls. Stainless steel strip passes through this new reducing mill at the rate of 500 feet per minute.

**American Steel & Wire
Division of
United States Steel**



the measure of
Performance Reliability
for more than a century



100-ton moving down hydraulic gap
frame press for Caterpillar Tractor Co.

Design simplicity, positive and
sensitive controls, trouble-free operation —

WILLIAMS-WHITE GAP FRAME PRESSES

Williams-White gap frame presses are bread-and-butter equipment in scores of plants. Production men like their versatility, speed, dependability and economy. Standard sizes, 25, 50, 75, 100, 150 and 200 tons, or built to fit your special requirements as to capacities, opening speeds, daylight, stroke, throat and table dimensions. Write for Bulletin No. 78.



WILLIAMS-WHITE & CO • MOLINE, ILLINOIS

When you buy a machine you buy creative engineering skills and craftsmanship. Among your chief considerations should be the record and integrity of the maker.



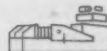
BULLDOZERS



PRESSES



SHEARS



BENDERS



PUNCHES



HAMMERS

SALES AGENTS: Portland, Ore.: Allied Northwest Machine Tool Corp.; Los Angeles: Engen Industrial Co.; Philadelphia: Edward A. Lynch Machinery Co.; Milwaukee: Pagel Machinery Co.; Seattle: Perine Machinery & Supply Co., Inc.; Chicago: Polhemus-Miller Co.; Pittsburgh: Frank Ryman's Sons; Cincinnati, Columbus and Dayton: Seifreut-Elstad Machinery Co.; St. Louis, Kansas City and Tulsa: Robert R. Stephens Machinery Co.; Buffalo: H. D. Thweatt Co.

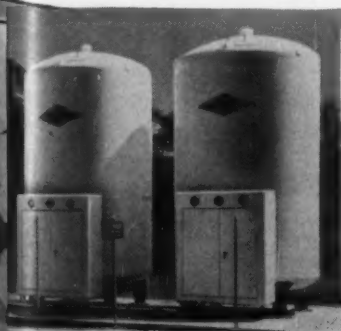


The Deitch

Co



Company increases scrap output and profit as **LIQUIDOX*** REDUCES LABOR



Permanent Liquidox Installation Serves One of the World's Largest Yards

"Our two metal-processing yards use oxygen at the rate of 4½ million cubic feet per month at peak operation," reports A. Deitch of The Deitch Company.

"Our work includes everything from processing locomotives to cutting 'buttons' to furnace size . . . and we have found that the most economical way of using oxygen is a Liquidox system of permanent storage and piping. Here's why:

1. Reduction of our operating and labor costs.
2. Security of supply (plenty of Liquidox is on site at all times).
3. Low-pressure storage eliminates high-pressure hazards.
4. Elimination of product loss (we use every foot we buy)."

Liquidox—Tailored for Large AND Small Metal-Processing Needs

This is just one example of how Liquid Carbonic's Liquidox service is tailored to fit the needs of the metal-processing industry. The Deitch Company has one of the largest processing yards in the world. It employs over 100 scrap cutters and uses 4000 feet of overhead runway, eight overhead cranes and five miles of railroad track. More than 20,000 feet of underground piping carries its oxygen supply throughout the yards.

Liquid Carbonic is your most dependable source for oxygen in liquid or gaseous form. See your Liquid Carbonic representative, too, for Liquidweld torches, regulators, and welding equipment to fit *all* scrap-processing requirements.

*LIQUIDOX—Liquid Carbonic's trade name for liquid oxygen.



GENERAL DYNAMICS CORPORATION Liquid Carbonic Division

Dept. 1A, 135 South LaSalle Street
Chicago 3, Illinois

In Canada: Liquid Carbonic Canadian Corporation, Ltd.,
Montreal 9, Quebec

Finkl die blocks and forgings made of vacuum degassed steel*



REDUCE DOWNTIME

Finkl vacuum degassed steels result in die blocks, hot work die steels, and forgings with greater ductility and toughness. This means that size for size, and/or hardness for hardness, the degassed steel reduces the chances of breakage and excessive wear under severe operating conditions.



REDUCE MACHINING TIME

Finkl vacuum degassed steels are cleaner. About 50% of the nonmetallic inclusions have been removed. Machineability is improved, with higher lusters obtainable in die block impressions, if desired. Fewer tool regrinds are required.



ASSURE DELIVERY

Finkl vacuum degassed steels promote high density centers in large die blocks and forgings therefore reducing the possibility of late shipment because of ultrasonic rejection.



For over 80 years Finkl has been producing top quality products. Now with the introduction of vacuum degassing of our electric furnace steels we have the most complete control of quality which enables us to offer the finest in die blocks, hot work die steels and flat die forgings. Call your Finkl representative.

A. Finkl & Sons Co.

2011 SOUTHPORT AVE • CHICAGO 14, ILLINOIS

Offices in: DETROIT • CLEVELAND • PITTSBURGH • INDIANAPOLIS • HOUSTON • ALLENTOWN • ST. PAUL
COLORADO SPRINGS • SAN FRANCISCO • SEATTLE • BIRMINGHAM • KANSAS CITY • BOSTON • LOS ANGELES

Warehouses in: CHICAGO • DETROIT • BOSTON • LOS ANGELES



Hats off to the profit makers!

Maintenance departments are major profit makers. Here's why:

A 10% reduction in maintenance costs can result in a 4% jump in profits in the average plant—according to latest Commerce Department figures.

Increasing numbers of cost-conscious maintenance men are adopting Organized Lubrication as one of the proven ways to reduce costs. As Texaco Lubrication Engineers have demonstrated time and again, an Organized Lubrication program can cut direct maintenance costs as much as 10%! (Other benefits: more dependable pro-

duction, reduced lube inventory, simplified purchasing.)

Managers throughout the U.S. who have installed and evaluated Organized Lubrication programs can testify to the profit gained.

Texaco Lubrication Engineers can offer help and helpful material to start an Organized Lubrication program in your plant. Why don't you look into it? Call our expert—or write for a copy of our book: "Organized Lubrication . . . Major Cost Control Factor."

☆ ☆ ☆
Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. IA-130.

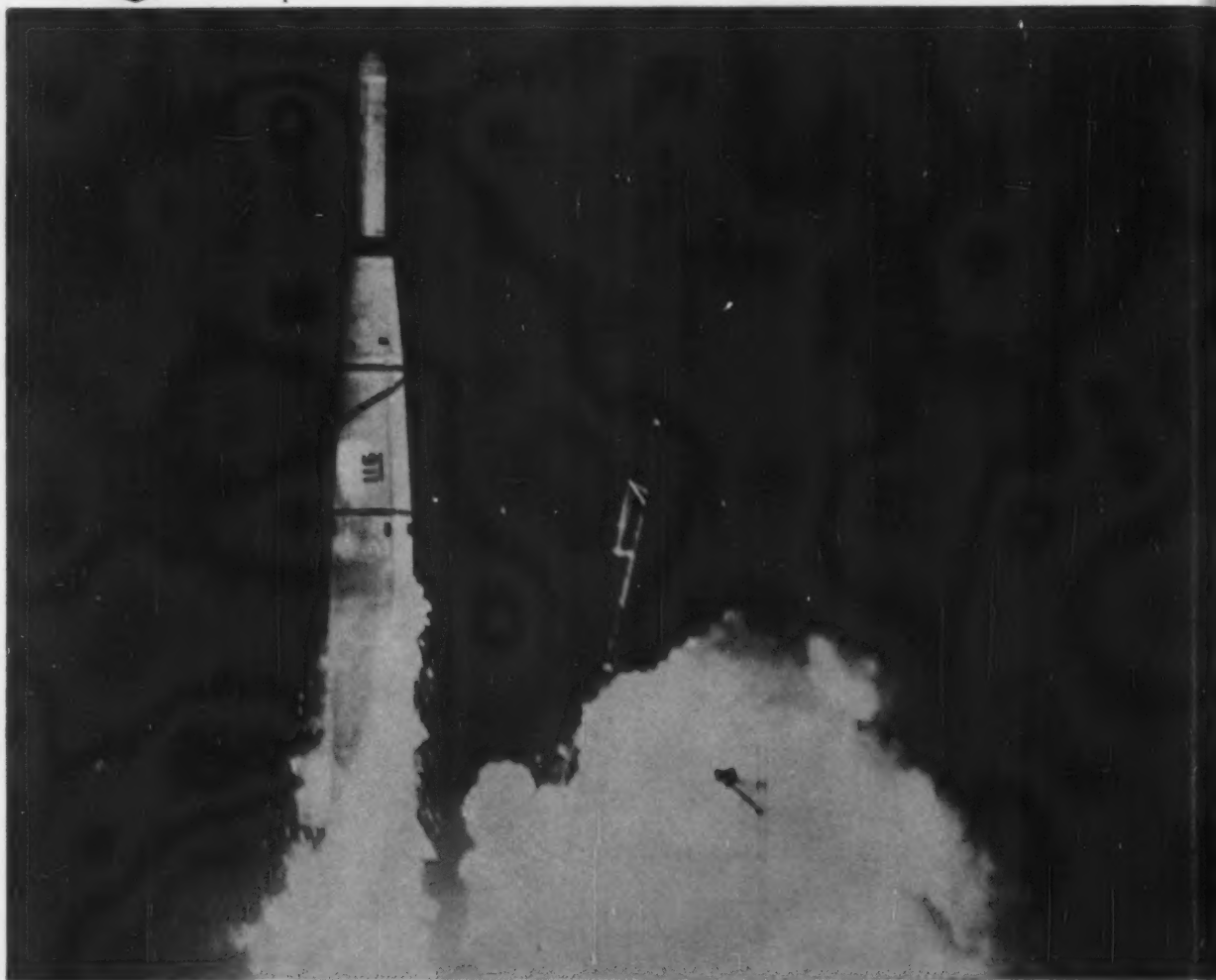


LUBRICATION IS A MAJOR FACTOR IN COST CONTROL



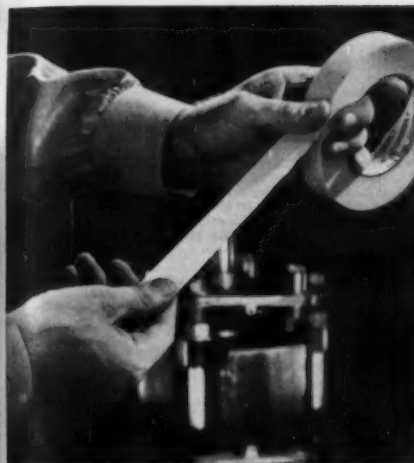
metal cleaning report no. 4

case histories from your distributor of Dow solvents



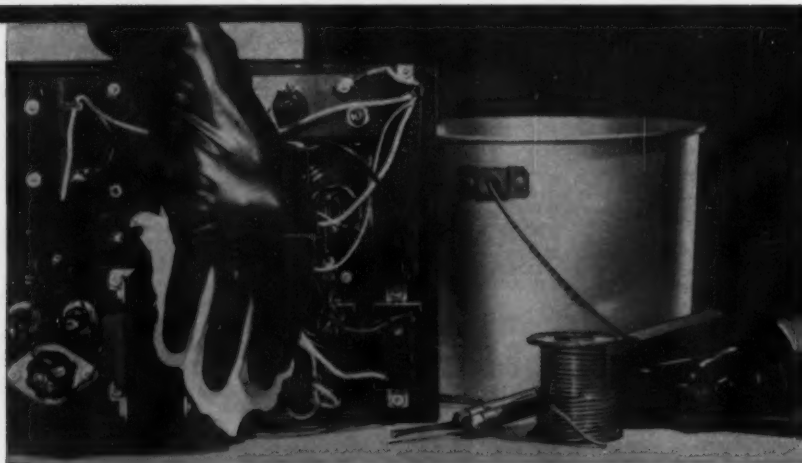
MISSILE COMPONENTS . . . no place for "almost clean"

An aircraft parts manufacturer, under sub-contract to deliver missile components, had a serious production problem. His regular vapor-degreasing solvent gave results which, at best, were not quite good enough for certain critical missile parts. As a result of a consultation with his distributor of Dow solvents, this manufacturer put NEU-TRI® to work . . . now his missile components *and* his standard line of aircraft parts come off the line thoroughly cleaned. He also gained a cost advantage: a long-lived neutral stabilizing system built into NEU-TRI prevents early solvent breakdown. Consequently he now can clean more parts with a gallon of solvent than ever before!



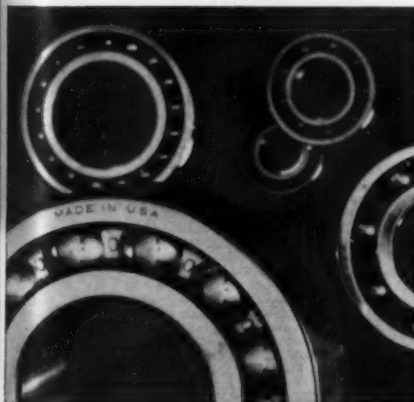
ELECTRICAL PARTS

The bottleneck was tape. This company makes electrical parts. During one stage of assembly, masking tape must be applied to certain critical parts. And the time and careful handling required to remove the tape at final assembly provided a real production bottleneck! They found the answer with Chlorothene® (Dow 1, 1, 1-trichloroethane, inhibited). Because of its high solvent power, Chlorothene takes tape off *fast*.



ELECTRONIC COMPONENTS

Choice of spray or wipe—This manufacturer of electronic parts states: "Chlorothene is the finest all-around solvent we've ever used." Chlorothene is widely used throughout the plant for both spray and wipe cleaning of the electronic parts, and for cleaning of production equipment! There's no fire or flash point by standard testing methods, and toxicity is very low, which keeps this safety-conscious management happy.



BALL BEARINGS

Teamwork for protection—This bearing manufacturer found nonflammable Dow perchloroethylene an ideal solvent for use in a combination cleaning-and-oil-bath formulation. Completed ball-and-race assemblies, dipped in the solution, came out completely free of all dirt and contaminants deposited during manufacture and assembly . . . while retaining a thin film of oil for protection during packaging and storage.



GAS EQUIPMENT

Solvent cleans-and-goes in a hurry—Cleaning of compressed gas tubes and lines can be a problem, but this company does the job the easy way. On the recommendation of their distributor of Dow solvents, they tried Dow methylene chloride. Its high solvency quickly, thoroughly removes grease, oil and other processing residue . . . and any solvent remaining after treatment evaporates in a hurry!

There's no doubt about efficiency in metal cleaning operations when one or more of the Dow metal cleaning solvents is on the job. Dow offers industry the widest line of chlorinated solvents, each one designed for specific applications and purposes. There's a Dow solvent to meet every solvent-cleaning need . . . one which will do the job efficiently, in short order!

Your distributor of Dow solvents is fully qualified to assist and advise you when problems of metal cleaning arise. Why not take advantage of the wide experience and knowledge which he and his staff have to offer? A call to him may be a shortcut to more efficient, economical metal cleaning in your plant.



FREE . . .
TECHNICAL SERVICE
on 24-hour notice

Your distributor of Dow solvents will gladly help you with any problems you're experiencing with metal cleaning solvents. He'll have a trained solvents specialist en route to your plant within 24 hours after your call is received.

Ask your distributor of Dow solvents for details.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

CHLOROTHENE®
TRICHLOROETHYLENE
PERCHLOROETHYLENE
METHYLENE CHLORIDE

See Your Distributor of Dow Solvents First!

FOR HELPFUL METAL CLEANING INFORMATION get in touch with your Dow Solvents Distributor



LETTER KEYS: (C)—Chloroethene; (M)—Methylene Chloride; (P)—Perchloroethylene (Industrial); (T)—Trichloroethylene

ALABAMA

BIRMINGHAM—Wittchen Chemical Company (CMP)
BIRMINGHAM—F. H. Ross and Company (CMPT)
MOBILE—Barada and Page, Inc. (CM)
MOBILE—McKesson & Robbins, Inc. (CMPT)
MOBILE—F. H. Ross and Company (CMP)
MONTGOMERY—Wittchen Chemical Company (CMP)

ARIZONA

PHOENIX—Braun Chemical Company (CMPT)
PHOENIX—Western Chemical Company (CMP)
TUCSON—Western Chemical Company (CMP)

CALIFORNIA

LOS ANGELES—Braun Chemical Company (CMPT)
LOS ANGELES—McKesson, Mafford Chemical Division (P)
LOS ANGELES—Pemaco, Inc. (P)
OAKLAND—B. N. Meacham Company (C)
SAN DIEGO—Braun Chemical Company (CMPT)
SAN DIEGO—Buel Town Company (T)
SAN FRANCISCO—Braun-Knecht-Heimann Co. (CMPT)
SAN FRANCISCO—G. N. Meacham Company (C)
SOUTH GATE—American Mineral Spirits (P)

COLORADO

DENVER—Braun-Knecht-Heimann Company (CM)
DENVER—Chemical Sales Company (CMPT)
DENVER—McKesson & Robbins, Inc. (CMPT)
DENVER—Mine and Smelter Supply Company (CMPT)
GRAND JUNCTION—C. D. Smith Co., Chemical Div. (CPT)

CONNECTICUT

NEW HAVEN—H. Krevit and Company, Inc. (P T)
SHELTON—Axtor-Cross Company (CMPT)
SOUTH NORWALK—McKesson and Robbins, Inc. (CMPT)
SOUTH NORWALK—Guard-All Chemical Company (P T)

FLORIDA

JACKSONVILLE—F. H. Ross and Company (CMPT)
JACKSONVILLE—Amica Burnett Chemical Co. (CMPT)
MIAMI—Amica Burnett Chemical Company (CMPT)
MIAMI—Biscayne Chemical Laboratories (CMPT)
ORLANDO—Atlantic Chemicals, Inc. (CMPT)
TAMPA—Atlantic Chemicals, Inc. (CMPT)
TAMPA—McKesson and Robbins, Inc. (CMPT)

GEORGIA

ATLANTA—Chapman Chemical Company (T)
ATLANTA—McKesson and Robbins, Inc. (CMPT)
ATLANTA—F. H. Ross and Company (CMPT)
ATLANTA—Southern States Chemical Company (CMPT)
BIRMINGHAM—Chapman Chemical Company (T)
COLUMBUS—F. H. Ross and Company (CMPT)
DUBLIN—Textile Aniline Chemical Company (T)

IDaho

BOISE—Van Waters and Rogers, Inc. (CMP)

ILLINOIS

AURORA—River Valley Chemicals, Inc. (CMPT)
CHICAGO—Central Solvents and Chemicals (CMP)
CHICAGO—C. P. Hall Company (CMPT)
CHICAGO—Keystone Aniline and Chemical Co. (C P)
CHICAGO—McKesson & Robbins, Inc. (CMPT)
CHICAGO—Joseph Turner and Company (CMPT)
DECATUR—McKesson & Robbins, Inc. (CMPT)
EFFINGHAM—Wabash Independent Oil Company (CPT)
MELROSE PARK—London Chemical Company (P T)
PEORIA—McKesson & Robbins, Inc. (CMPT)
ROCKFORD—Industrial Oil and Chemical Company (C)
ROCKFORD—Viking Chemical Company (CMPT)

INDIANA

EVANSVILLE—Barning Industrial Chemicals (CMPT)
EVANSVILLE—Charles Leich and Company (P)
FT. WAYNE—Hoosier Solvents and Chemicals (CMP)
FT. WAYNE—Inland Chemical Corporation (CMPT)
HAMMOND—Inland Chemical Corporation (CMPT)
INDIANAPOLIS—Hoosier Solvents and Chemicals (CMPT)
INDIANAPOLIS—Wm. Lyon Chemical Company (CMPT)
INDIANAPOLIS—Ulrich Chemical Company, Inc. (C T)
KOKOMO—Plating Products, Inc. (P T)
LOGANSPOUT—Plating Products, Inc. (P T)
SOUTH BEND—Inland Chemical Corporation (CMPT)
SOUTH BEND—Stevens Oil Company (CMP)

IOWA

BETTENDORF—Barton Naphtha Corporation (CMPT)
BURLINGTON—McKesson & Robbins, Inc. (CMPT)
CEDAR RAPIDS—McKesson & Robbins, Inc. (CMPT)
COUNCIL BLUFFS—Barton Solvents, Inc. (CMPT)
DAVENPORT—McKesson & Robbins, Inc. (CMPT)
DES MOINES—Barton Naphtha Company (CMPT)
SUMNER—Overton Chemical Sales (C)

KANSAS

WICHITA—Barada and Page, Inc. (CM)
WICHITA—Reid Supply Company (CPT)

KENTUCKY

LOUISVILLE—Dixie Solvents and Chemicals (CMP)
LOUISVILLE—Gane Chemical and Supply Company (P)
LOUISVILLE—McKesson and Robbins, Inc. (CMPT)

LOUISIANA

BATON ROUGE—Barada & Page, Inc. (C)
LAKE CHARLES—Barada & Page, Inc. (CM)
NEW ORLEANS—Barada & Page, Inc. (C)
NEW ORLEANS—Southern Solvents and Chemicals (CMPT)

MAINE

LEWISTON—Polar Chemical Company (CMPT)

MARYLAND

BALTIMORE—B. J. Howard Company (CMPT)
BALTIMORE—Leidy Chemicals Corporation (CMP)

BALTIMORE—Sailer-Hoches Chemicals, Inc. (C)
BALTIMORE—Tilley Chemical Company (T)

MASSACHUSETTS

BOSTON—Howe and French, Inc. (CM)
BOSTON—Linder and Company, Inc. (CMPT)
BOSTON—McKesson and Robbins, Inc. (CMPT)
EVERETT—Sessions-G.H. Ford Co., Inc. (CMPT)
FRAMINGHAM—Axtor-Cross Corp. of Mass. (CPT)
HINGHAM—Stephen-Roger, Incorporated (CMPT)
HOLYOKE—Eastern Chemicals, Inc. (M)
SPRINGFIELD—Chemical Corporation (CMPT)
SPRINGFIELD—Hampton Color and Chemical Co. (CMPT)
STONEHAM—George Mann & Co. (CMPT)
WORCESTER—George H. Clark and Co. (CMPT)

MICHIGAN

DETROIT—Eaton Chemical and Dyestuff (CMPT)
DETROIT—Manpro Corporation (CMPT)
DETROIT—McKesson and Robbins, Inc. (CMPT)
DETROIT—Western Solvents and Chemicals (CMPT)
DETROIT—Whitfield Chemical Company (P)
EAST DETROIT—Sherwood Chemical Company (P)
ESCANABA—Haviland Products Company (CMPT)
FERNDALE—Manpro Corporation (CMPT)
GRAND RAPIDS—P. B. Gast and Sons Company (C)
GRAND RAPIDS—Haviland Products Company (CM)
GRAND RAPIDS—McKesson and Robbins (MPT)
GRAND RAPIDS—Wolverine Solvents and Chemicals Co. (CMPT)

LANSING—Carrier Stephens Company (CMPT)
LANSING—Wheaton Chemical Company (CPT)
LUDINGTON—P. B. Gast and Sons Company (C)

MINNESOTA

MINNEAPOLIS—W. H. Barber Company (P T)
MINNEAPOLIS—McKesson and Robbins, Inc. (CMPT)
ST. PAUL—Lyons Chemicals, Inc. (CM)

MISSISSIPPI

JACKSON—F. H. Ross and Company (CMP)

MISSOURI

KANSAS CITY—Barada and Page, Inc. (CM)
KANSAS CITY—Missouri Solvents and Chemicals (CMPT)
KANSAS CITY—Sherwood and Company, Inc. (CMPT)
ST. LOUIS—Barada and Page, Inc. (CM)
ST. LOUIS—Independent Oil Company (CMPT)
ST. LOUIS—McKesson and Robbins, Inc. (CMPT)
ST. LOUIS—G. S. Robins and Company (CMPT)
ST. LOUIS—St. Louis Solvents and Chemicals (CPT)
ST. LOUIS—Missouri Solvents and Chemicals (CMPT)

NEBRASKA

OMAHA—Barton Solvents, Inc. (CMPT)
OMAHA—McKesson and Robbins, Inc. (CMPT)

NEW JERSEY

BLOOMFIELD—McKesson & Robbins, Inc. (CMPT)
CAMDEN—Callahan Chemical Company (MPT)
EAST PATERSON—Aetha Color and Chemical Company (CMPT)

NEW YORK

MURRAY HILL—American Mineral Spirits (CMPT)
NEWARK—American Oil and Supply (CPT)
NEWARK—National Oil and Supply Company (CMPT)
PALISADES PARK—Philip A. Hunt Company (C)
PERTH AMBOY—Modern Mineral Solvents (MPT)
VINELAND—Lirio Chemical Company (CPT)

NEW MEXICO

ALBUQUERQUE—Braun Chemical Company (CMPT)
ALBUQUERQUE—Edmunds Chemical Company (CMPT)

NEW YORK

ALBANY—Eastern Chemical (CMPT)
ATHENS—Spick Products Company (P T)
BINGHAMTON—Collier Chem. (CM)
BRONX—Eco Solvents Corporation (MPT)
BROOKLYN—Enequist Chemical Company (CPT)
BUFFALO—Buffalo Solvents and Chemicals (CMPT)
BUFFALO—Chemical Sales Corporation (CMPT)
BUFFALO—McKesson and Robbins, Inc. (CMPT)
EDGEMERE—Hogan Industrial Supply (CMPT)
GLOVERSVILLE—Eastern Chemicals, S. H. Ireland Div. (CM)
KEARNY—American Chemicals, Incorporated (CMPT)
LONG ISLAND CITY—Peerless Oil and Chemical (CMPT)
NEW YORK—American Chemicals, Inc. (CMPT)
NEW YORK—McKesson and Robbins, Inc. (CMPT)
POUGHKEEPSIE—Duse Chemical Company (C)
RENSSELAER—Eastern Chemicals, Inc. (CM)
ROCHESTER—Chemical Sales Corporation (CMPT)
SYRACUSE—Eastern Chemicals, Inc. (CM)
UTICA—Manarch Laboratories (CMPT)

NORTH CAROLINA

CHARLOTTE—F. H. Ross and Company, Inc. (CMPT)
CHARLOTTE—Moreland Chemical Company (CMPT)
CHARLOTTE—Southern States Chemical Co. (CMPT)
GREENSBORO—F. H. Ross and Company, Inc. (CMPT)

OHIO

AKRON—Farley Solvents Company (CMPT)
AKRON—C. P. Hall Company (CMPT)
CANTON—Bison Corporation (CPT)
CINCINNATI—Amso Solvents and Chemicals (CMPT)
CINCINNATI—Chipman Supply Company (T)
CINCINNATI—Herbert Chemical Company (P T)
CINCINNATI—McKesson and Robbins, Inc. (CMPT)
CLEVELAND—Mon-Gill Chemical Company (CPT)
CLEVELAND—McKesson and Robbins, Inc. (CMPT)
CLEVELAND—National Solvents Corporation (CPT)
CLEVELAND—Ohio Solvents and Chemicals, Inc. (CMPT)

CLEVELAND—R. W. Renton Company (CPT)
COLUMBUS—McKesson and Robbins, Inc. (CMPT)
DAYTON—Industrial Chemical Products Co. (CPT)
DAYTON—Ottosen Solvents, Inc. (T)
LIMA—Thomson Chemical Company (CPT)
TOLEDO—Inland Chemical Co. (CMPT)
TOLEDO—Toledo Solvents and Chemicals (CMPT)
TOLEDO—M. L. Wilcox Company (CPT)
YOUNGSTOWN—Rhial Supply Company (CMPT)

OKLAHOMA

OKLAHOMA CITY—Barada and Page, Inc. (CM)
TULSA—Barada and Page, Inc. (CM)
TULSA—Chemical Products, Inc. (CMPT)

OREGON

PORTLAND—Van Waters and Rogers (CMP)

PENNSYLVANIA

CONSHOHOCKEN—American Mineral Spirits (CMPT)
EASTON—Lehigh Valley Chemical Company (CMPT)
ERIE—Manarch Laboratories (T)
MCKEES ROCK—Apex Soap and Sanitary Corp. (CPT)
PHILADELPHIA—Alex C. Ferguson Company (CPT)
PHILADELPHIA—McKesson and Robbins, Inc. (CMPT)
PHILADELPHIA—Phillips and Jacobs, Inc. (CM)
PHILADELPHIA—Pioneer Salt Company (CMPT)
PHILADELPHIA—George Senn, Inc. (CMPT)
PITTSBURGH—Carmac Chemical Company, Inc. (CPT)
PITTSBURGH—Carman-Pittsburgh Company (CPT)
PITTSBURGH—Dacor Chemical Products Company (CPT)
PITTSBURGH—P. Pitt Chemical Company (C)
PITTSBURGH—McKesson and Robbins, Inc. (CMPT)
READING—R. W. Eaken, Inc. (CPT)
READING—Textile Chemical Company (CPT)
SCRANTON—Scranton Chemical Company (CPT)
YORK—Industrial Solvents and Chemicals (CPT)

RHODE ISLAND

CRANSTON—Gifford-Lynch Chemical Co. (CMPT)
PROVIDENCE—George Mann and Company (CMPT)
PROVIDENCE—Sessions Gifford Company, Inc. (CMPT)

SOUTH CAROLINA

CHARLESTON—Burriss Chemical Company (CPT)
GREENVILLE—F. H. Ross and Company (CMPT)
GREENVILLE—Southern States Chemical Co. (CMPT)
SPARTANBURG—Moreland Chemical Company, Inc. (CMPT)

TENNESSEE

CHATTANOOGA—Chapman Chemical Co. (CMPT)
CHATTANOOGA—Wilson Sales Company (CMPT)
KINGSPORT—Chem-I-Dent, Inc. (CPT)
MEMPHIS—Chapman Chemical Company (CMPT)
MEMPHIS—C. P. Hall Company (CMPT)
MEMPHIS—Ideal Chemical and Supply Co. (CMPT)
NASHVILLE—Chapman Chemical Company (CMPT)
NASHVILLE—Wilson Sales Company (CMPT)

TEXAS

AMARILLO—State Chemical Company (CMPT)
AUSTIN—R. M. Hughes Company, Inc. (CMPT)
BEAUMONT—Dooley and Son (CMPT)
CORPUS CHRISTI—Barada and Page, Inc. (CM)
DALLAS—Barada and Page, Inc. (CM)
DALLAS—McKesson & Robbins, Inc. (CMPT)
DALLAS—Texas Solvents and Chemicals Co. (C)
DALLAS—Van Waters and Rogers, Inc. (CMPT)
EL PASO—Baron Chemical Company (CMPT)
EL PASO—Braun Chemical Company (CMPT)
EL PASO—Mine and Smelter Supply Company (P)
FORT WORTH—Barada and Page, Inc. (CM)
FORT WORTH—Worth Chemical Products Co. (CMPT)
HOUSTON—Barada and Page, Inc. (CM)
HOUSTON—W. H. Curtin and Company (P)
HOUSTON—Dixie Chemical Company (CMPT)
HOUSTON—R. M. Hughes Company, Inc. (CMPT)
HOUSTON—McKesson, Texas Chemical Division (CMPT)
HOUSTON—Texas Solvents and Chemicals Co. (CMPT)
HOUSTON—Van Waters and Rogers, Inc. (CMPT)
LUBBOCK—State Chemical Company (CMPT)
MIDLAND—State Chemical Company (CMPT)
ODESSA—Barada and Page, Inc. (CM)
SAN ANTONIO—R. M. Hughes Company, Inc. (CMPT)
SAN ANTONIO—McKesson and Robbins, Inc. (CMPT)

UTAH

SALT LAKE CITY—Braun-Knecht-Heimann Co. (CMPT)

VIRGINIA

NORFOLK—Taylor Salt and Chemical Company (CPT)
RICHMOND—Phipps and Bird, Inc. (CMPT)
ROANOKE—Hawmaer Supply Company (CMPT)

WASHINGTON

SEATTLE—Van Waters and Rogers, Inc. (CMP)
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HUNTINGTON—Cabell Chemical Company (CPT)

WISCONSIN

CHIPPEWA FALLS—Lyons Chemical (CMPT)
LA CROSSE—North Central Chemical, Inc. (MPT)
LA CROSSE—Wisconsin Solvents & Chemicals Corp. (CMPT)
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See Your Distributor of Dow Solvents First!

Greater Corrosion Resistance

Longer Fatigue Life

Less Product Incrustation



new tests prove

CONTOUR-WELDED* STAINLESS TUBING

provides all three!

A recent series of tests prove TRENTWELD® tubing, made by the exclusive *Contour-Weld* process, is smoother than any other full-finished tubing. And still other tests show this extra smoothness ensures longer fatigue life, greater resistance to corrosion and less product incrustation.

But here's why *Contour-welded* tubing is smoother inside:

First, it's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless must be extruded or pierced.

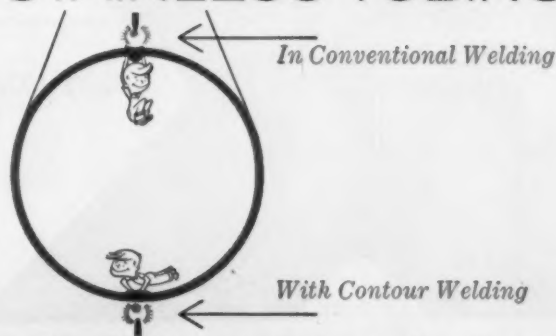
And second, it's smoother than other welded tubing because the Trent-patented *Contour-Weld* process virtually eliminates the weld bead.

But why not get full details on *Contour welded* tubing's superiority? Send for the free 48-page "Trent Weld Manual." It's chock-full of details on *Contour-welded* tubing in sizes from $\frac{1}{4}$ " to 40" — in stainless and high alloy steels, titanium, zirconium, zircaloy and Hastelloy†. Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



stainless and high alloy pipe and tubing
TRENT TUBE COMPANY



In CONVENTIONAL WELDING of tubes, gravity pulls molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

*With CONTOUR WELDING the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.

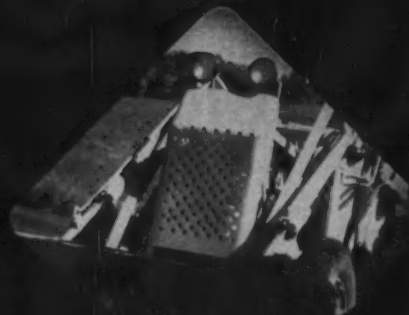
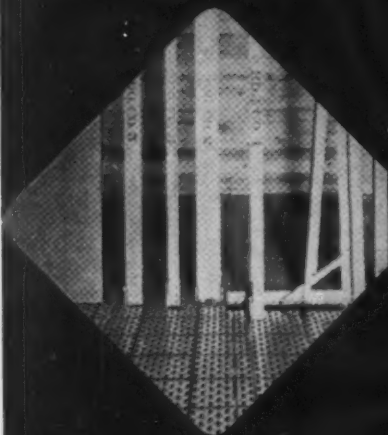
Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.

HOW TO PROFIT FROM PERFORATIONS

*...in
perforated
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machinery*

...in your product

Hundreds of design applications for Hendrick perforated metals are waiting for *you* to help discover them. When you do, you'll find you can use Hendrick perforated metals for both ornamental and functional purposes—and they'll often cost less to install and last longer than many comparable materials.

HENDRICK

MANUFACTURING COMPANY

37 Dundaff Street, Carbondale, Pa.

Hendrick perforated metals are available in a variety of functional and ornamental patterns, in every available commercially rolled metal. Hendrick also perforates masonite, rubber, plastic, or insulated board. Each can be supplied with varying numbers and sizes of perforations, in plain or panel effects.

Write for free catalog from Hendrick—the pioneer in perforated metals—and discover other ways of applying perforated metals to your product or equipment designs.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

QUICK COMPARISON CHART

Some unique combinations of electrical and physical properties in Anaconda metals that may save you money—handle tough jobs better

Properties shown for precipitation-hardened condition—Heat-treatable alloys	ELECTRICAL CONDUCTIVITY % IACS	TENSILE STRENGTH psi	YIELD STRENGTH at 50% ext. under load, psi	ELONGATION % in 2 in. or 4xD	MACHINABILITY compared with F.C. Brass at 100	FORMS AVAILABLE
Chromium Copper-999 (Cu 99.05%, Cr .85%, Si .10%)	75	65,000	55,000	20	20	Red Wire Tube Forgings Strip
Leaded Nickel Copper-831 (Cu 97.8%, Pb 1.0%, Ni 1.0%, P .2%)	55	80,000	70,000	7	80	Rod
Cunisil-837 (Cu 97.5%, Ni 1.9%, Si .6%)	30 to 42	80,000	70,000	8	40	Rod

To give you a basis of comparison, here are properties of two standard Anaconda electrical coppers

ETP Copper—100 (Cu 99.9+%)	100	48,000	40,000	15	20	All mill forms
Leaded Copper—126 (Cu 99.0%, Pb 1.0%)	98	48,000	40,000	12	80	Rod bar

The values given above are intended as a guide to some unusual combinations of electrical and physical properties available among Anaconda alloys. If any of them gives you an idea for possible solution to

a tough problem or indicates a way to cut costs without sacrificing quality or performance — see your American Brass representative for more details. Or send in this coupon today.

8549

COPPER • BRASS • BRONZE • NICKEL
SILVER MILL PRODUCTS

ANACONDA®
PRODUCTS

Made by The American Brass Company

The American Brass Co., Waterbury 20, Conn.
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

Please send me more information about the following alloys:

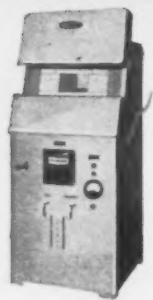
- ☐ Chromium Copper—999 ☐ Leaded Nickel Copper—831
☐ Cunisil—837 ☐ Leaded Coppers
☐ Electrolytic Tough Pitch Copper—100

Name

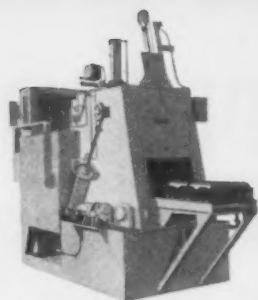
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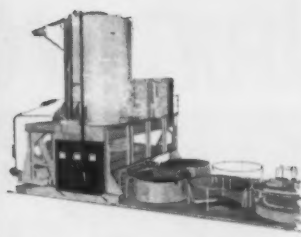
City Zone State



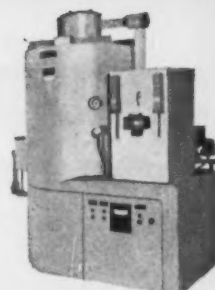
Laboratory Equipment: One-unit box furnace (shown), muffle or for non-oxidizing atmosphere with temperature range to 3000° F.



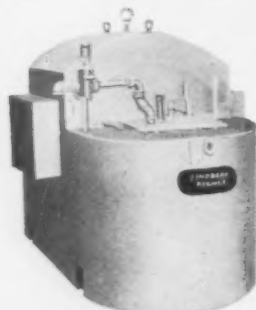
Automatic Carbonitriding Furnaces: Automated integral quench type (shown) with CORRATHERM electric elements.



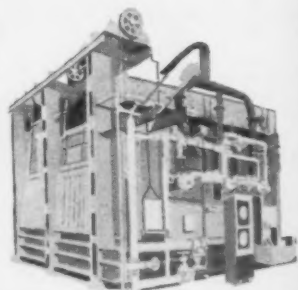
Gantry Type Furnaces: Vertical, controlled-atmosphere, drop bottom, hardening furnace (shown). Complete installation field-installed by Lindberg.



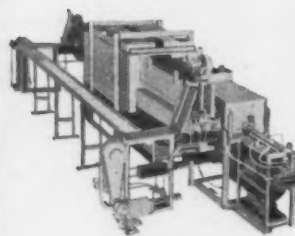
Atmosphere Generators: Hye generator (shown) for endothermic atmospheres. Generators for all required atmospheres.



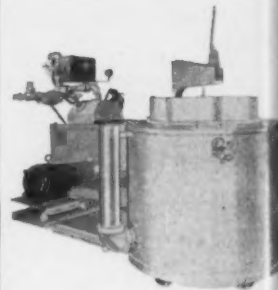
Melting and Holding Furnaces: Electric resistance furnace (shown) with capacities of 750 lbs. to 1500 lbs.



Aluminum Reverberatory Furnaces: Twin-chamber melting and holding furnace (shown) with 45,000 lbs. capacity.



Ceramic Kilns: Fully automatic, atmosphere controlled kiln (shown) has 5 control zones for flexibility. Maximum temperature, 2700° F.



Cyclone Tempering Furnaces: Batch type fuel fired tempering furnace (shown). Famous in metal treating industry for years.

When a product needs heat let Lindberg apply it

Applying heat to industry has been our only vocation for many years. When your product needs heat it makes sense to consult the most widely experienced experts you can find. We believe we have them here at Lindberg. First of all, we manufacture a full line of equipment, the most complete in the field; heat treating furnaces, salt bath furnaces, melting furnaces, induction heating units, ceramic kilns, laboratory and pilot plant furnaces—electric or fuel fired, built in our plant or field installed. So, we can recommend just the

correct techniques best suited to your individual requirements and your production methods. Here at Lindberg we have an exceptionally creative group of metallurgists, research technicians and engineers, the best in the business, we vow. You can count on them to answer your industrial heating problems satisfactorily, no matter how complex or unusual. Our world-wide organization, with plants and subsidiary companies in many countries, makes this superior service available to you anywhere.

LINDBERG ENGINEERING COMPANY

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Etablissements Jean Aubé
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Milan

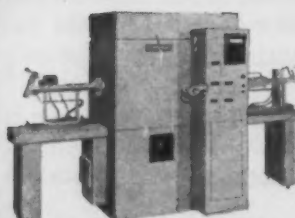
SOUTH AFRICA
Elco-South Africa
Johannesburg

SPAIN
Aube-Lindberg, S.A.E.
Barcelona

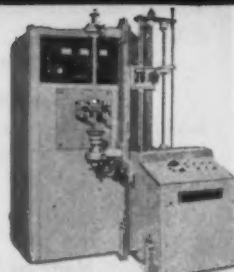
ENGLAND
Electric Resistance Furnace Company, Ltd.
Weybridge, Surrey

SWITZERLAND
Elco-Industrieelven A.G.
Basel

LINDBERG heat for industry



High Temperature Furnaces: New Graphite Tube Furnace (shown) with temperature range 2800° F. to 5000° F. for research and production in metal and ceramic fields.



Induction Heating Units: New Lindberg Floating Zone Scanner for precise production of hyper-pure semi-conductor materials and metals and Induction Heating Unit (shown).

Electric at
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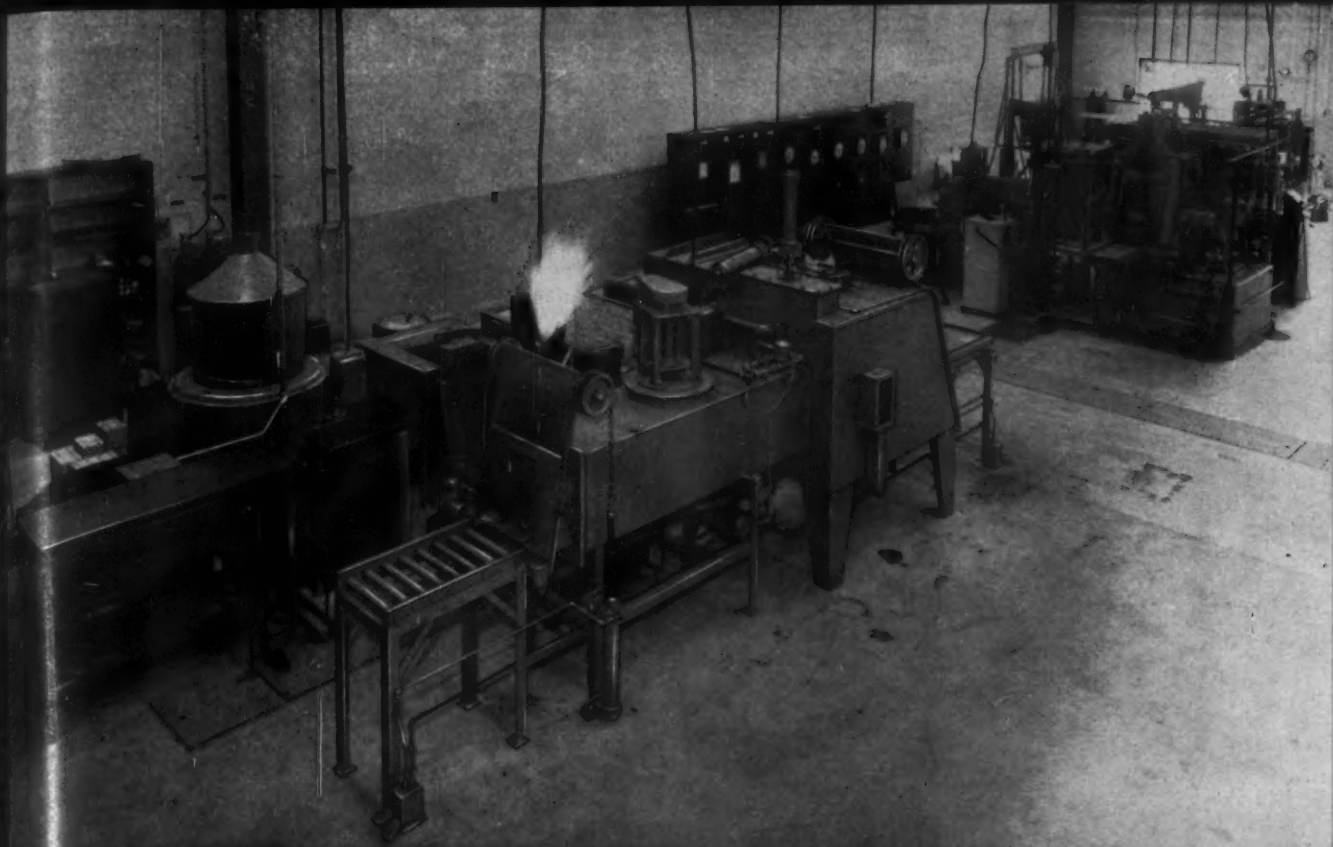
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General view of complete Heat Treating Department at new plant of Lear, Inc., Grand Rapids, Michigan. All equipment including furnaces, Hyen atmosphere generator, control panels, oil quench is by Lindberg.



Electric atmosphere brazing and annealing furnace, hand pusher type. 2100° F. maximum temperature.



Electric pit furnace for treatment of high temperature alloys in dry hydrogen atmosphere. Tap transformer also shown.



The retort for high temperature pit furnace for treatment of alloys at 2200° F. (left). Production tempering furnace, 22' x 26' work space, shown at right.



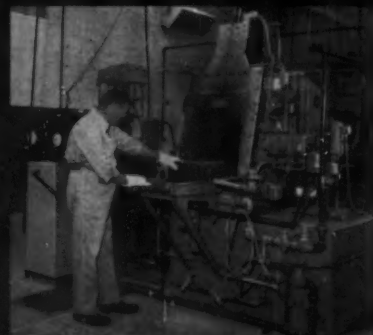
Atmosphere tempering furnace, 16' x 24' work space, for both gaseous nitriding and steam treating. One retort in foreground.

LINDBERG

**Equips
Complete
Heat Treating
Department at
Lear, Inc.**

The heat treating requirements for the new Grand Rapids plant of Lear, Inc., were put into Lindberg's hands. We supplied them in the way the photographs show. Our engineers cooperated fully with Lear in the selection of the proper Lindberg equipment and the layout of the complete heat treating department. This installation illustrates one of the big advantages of consulting with Lindberg. Our years of experience in all phases of the application of heat to industry, our complete line of all types of industrial heating equipment offer the best assurance that you can coordinate all your needs in one reliable, experienced source. Consult your local Lindberg Field Representative (see classified phone book) or write us direct.

LINDBERG *heat for industry*



Integral quench furnace with CORRATHERM electric heating elements for carbonitriding and general heat treating.

New
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Heat-



Trailer axles take shape as automatic butt welder upset flash welds spindles to each end of 40-inch lengths of Pitts-

burgh Steel Co.'s mechanical tubing at Kenton, Ohio, plant of Rockwell-Standard's Transmission and Axle Division.

An Axle Axiom: Long Service Life

Pittsburgh Steel Company's Seamless Tubes Give Years of Service in Rockwell-Standard Corp.'s Trailer Axles

Mechanical tubing from Pittsburgh Steel Company covers a lot of ground—in truck trailer axles.

Pittsburgh Steel is a prime supplier of mechanical tubing to the Kenton, Ohio, trailer axle plant where the Transmission and Axle Division of Rockwell-Standard Corp. makes trailer axles for every major trailer manufacturer.

• Uses C1040 Grade Tubing—Rockwell-Standard uses AISI C 1040 grade hot rolled tubing, ranging from 4-inch outside diameter

with a $\frac{3}{8}$ -inch wall thickness to tubing 6 inches in diameter with $\frac{1}{2}$ -inch wall.

Typical tubing shipped to Rockwell-Standard is made of fine grained steel in a uniform hardness range which enables the customer to develop the final physical properties he wants by heat treatment.

Pittsburgh Steel tubing performs satisfactorily in Rockwell-Standard's processing operations and satisfies the ultimate user—the trailer manufacturer

—because we meet these requirements from tube to tube and from shipment to shipment.

Hardness is a prime requirement because lack of uniformity would require more costly operations at Rockwell. With Pittsburgh Steel tubes, heat treating can be standardized with predictable results.

Weldability scores high. Long service life of trailer axles demonstrates the weldability of Pittsburgh Steel's tubing. With an average of

10 welds to be good tests pro-

Freed mote pro treating. with diff heat trea tion is Steel tub

Uniform to preven quenching ening in operation

• **Tubin** by Rock will trac inches, b spindles one on e are made

Next, pass thr on a mov hours each long fur temperat 1½ min from the

To ten desired B through soaks for

Rockw ing of 26 218 to 26

Axles t a Wheel Machine chined t flash is machine

• **After** brackets, cams are relief foll by weldin 900 degre

On the axle gets the brak brackets added, th

Close-up merged a made sim

10 welds in every axle, welds have to be good. Strength and porosity tests prove they are good.

Freedom from scale helps promote predictable results from heat treating. Scale would produce steel with different rates of hardness after heat treating. No de-scaling operation is necessary with Pittsburgh Steel tubes.

Uniformity of wall thickness helps to prevent warping of axles in oil quenching and eliminates re-straightening in many cases or holds such operations to a minimum.

• **Tubing first is cut to length** by Rockwell to make axles which will track either 70 inches or 71½ inches, both standard widths. Forged spindles then are flash upset welded, one on each end of the tube. Welds are made simultaneously.

Next, tube and spindle assemblies pass through a high heat furnace on a moving conveyor. For the two hours each assembly is in the 60-foot long furnace it is subjected to a temperature of 1500 degrees F. Each 1½ minutes, an assembly emerges from the furnace to be oil quenched.

To temper the assemblies to the desired Brinell hardness, each passes through a draw furnace where it soaks for an hour in 1000 degrees F.

Rockwell-Standard wants a rating of 269 to 321 for spindles and 218 to 269 for tubing.

Axles then are cleaned by shot in a Wheelabrator and moved to the Machine Shop. Spindles are machined to final contours, welding flash is removed and threads are machine rolled.

• **After accessories**, like spider brackets, diaphragm brackets and cams are welded to the axle, stress relief follows to ease strains set up by welding. An hour's treatment at 900 degrees F. does the trick.

On the final assembly line, each axle gets a brake system fitted to the brake spiders. Nylon support brackets and grease fittings are added, the axle is greased, painted

Close-up of brake spider being submerged arc welded. Four welds are made simultaneously.



Pittsburgh tubing, five inches in diameter, is being ground to .4880 inches to meet specifications.

and moved to the shipping platform.

You don't have to be a manufacturer of axles to enjoy the same benefits that Rockwell-Standard gets from Pittsburgh Steel tubing.

Any tube user who wants to lower production costs while making a better product can

profit by using Pittsburgh Steel tubular specialties.

You get the physicals you want and you can expect better performance in fabrication. Talk to a Pittsburgh Steel man today. You'll find him in one of the district offices listed below.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company Los Angeles, California	Earle M. Jorgensen Co. Perry Kilsby, Inc. Los Angeles, California	C. A. Russell, Inc. Houston, Texas
Chicago Tube & Iron Company Chicago, Illinois	Mapes & Sprowl Steel Co. Union, New Jersey	Ryerson, Joseph T. & Son, Inc. Chicago, Illinois
Cleveland Tool & Supply Co. Cleveland, Ohio	Metal Goods Corporation St. Louis, Missouri	Solar Steel Corporation Cleveland, Ohio
Drummond McCall & Co., Ltd. Montreal, Quebec, Canada	Miller Steel Company, Inc. Hillside, New Jersey	Steel Sales Corporation Chicago, Illinois
Edgcomb Steel Company Philadelphia, Pennsylvania	A. B. Murray Co., Inc. Elizabeth, New Jersey	Tubular Sales Detroit, Michigan
Gilmore Steel & Supply Co. San Francisco, California		Ward Steel Service Company Dayton, Ohio

Pittsburgh Steel Company

Grant Building

Pittsburgh 30, Pa.



DISTRICT SALES OFFICES

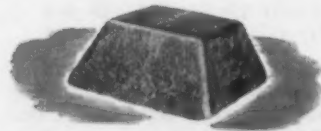
Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio



"Metallic yield goes up with pig-cast ferrosilicon"

Now steel producers can increase silicon recoveries and simplify handling operations with new ELECTROMET pig-cast 75% ferrosilicon. The pigs provide a convenient, uniform lump size for ferrosilicon additions to steel. They produce a higher, more consistent metallic yield because fines are practically eliminated. Ready solubility is achieved because pig additions penetrate the molten steel very quickly. The uniform shape and weight of the pigs (10 to 15 lbs. or 20 to 25 lbs.) make handling easier in both unloading and furnace operations. Your UNION CARBIDE METALS representative will gladly give you further information.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.



Pigs are easy to handle and give a high metallic yield.



Electromet Brand Ferroalloys
and other Metallurgical Products

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

THE STEEL SUPPLY OUTLOOK takes on a little better tone. In the second week of the injunction, steel mills shipped more than 1.5 million tons of steel. This was slightly above optimistic timetables of mills. Contrary to expectations, the shipping rate has moved up much in line with ingot rates.

AUTOMAKERS WILL SUFFER THROUGH low-level production and sales for at least another month. New car sales in November seem headed for the worst monthly level in a year. December will be poor, too. GM has begun to call back some plant workers, but car production won't resume until the middle of December.

PROGRESS OF THE SPACE PROGRAM is bringing some earth-bound benefits. Many of the advanced manufacturing techniques developed in space projects are finding other uses. Example: Wyman-Gordon Co. has a new alloy--Astroloy--which was developed to lick the temperature problem. But it may also spur some new turbine designs.

THE LONG-RANGE FORECAST FOR SUPPLIERS of oil drillers isn't too encouraging. Oil drilling operations are falling below estimates, at least domestically. And indications are that the number of new U. S. wells will not rebound. Right now, because of the steel strike, oil country goods are tight. But capacity could exceed demand for years to come.

THE ILL-FATED EDSSEL, which never could get off the ground in sales, is being discontinued by the Ford Motor Co. after two years of frustration. The car was researched at a time when all indications pointed to an expansion of the medium-priced field. Instead, it was brought out when that market area was contracting. The Mercury-Edsel-Lincoln Div. now becomes the Mercury-Lincoln Div.

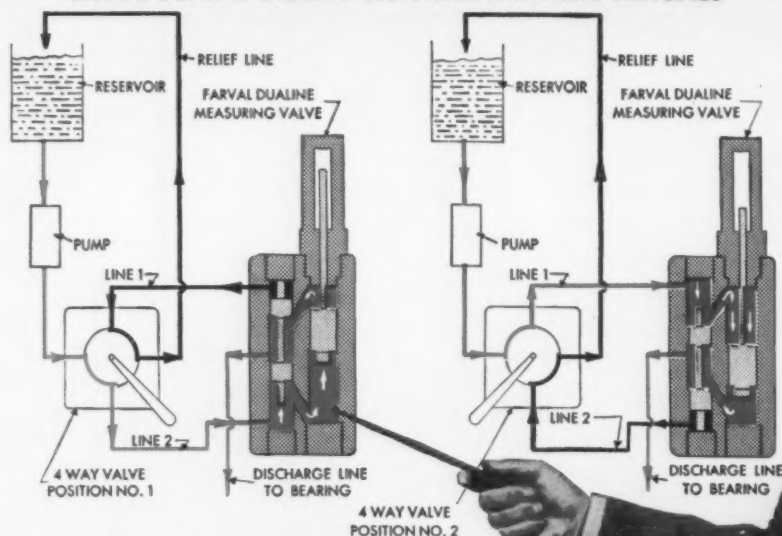
THE ADMINISTRATION'S EFFORTS TO HOLD DOWN defense spending in the face of rising costs may mean some procurement cutbacks. Manpower and research are slated to suffer, but the drive could also mean procurement cuts. They may not stand up, however. Democrats in Congress will make defensive strength a big issue and will try to up Ike's budget recommendations.

FOREIGN NATIONS WILL BUY more machinery from the U. S. next year. International Cooperation Administration, the big U. S. aid agency, is about to rule that foreign aid funds must be spent in the U. S. Up to now, most sales went to foreign producers.

FARVAL
—Studies in
Centralized
Lubrication
No. 246

*"For positive lubrication of large,
medium and heavy-duty installations
... it's a Farval Dualine System!"*

FARVAL DUALINE SYSTEMS USE SIMPLE HYDRAULIC PRINCIPLES



*With Farval Dualine centralized lubricating systems you get
the following distinct advantages over other type systems ...*



(a) Much lower operating pressures with consequently less danger of soap separation on grease systems. Also, less danger of system damage due to high lubricant pressures.

(b) Large lubricant passages with no pinhole ports, ensures practically full pump pressure for every metering valve. This is one of the reasons why Farval Dualine systems operate on lower pressures — give less sieving and working of lubricants.

(c) Positive indication at each bearing — does not have to depend on the questionable action of a single indicator at the pump.

(d) Each metering valve individually adjustable for the requirements of the bearing it serves.

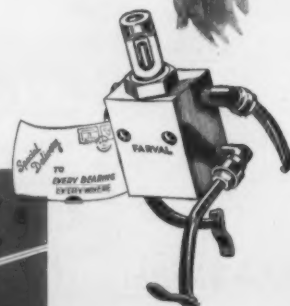
(e) Independent metering valve operation. Should trouble develop with one valve, the system will continue to operate. Only one bearing (not all the bearings) will require hand lubrication until trouble is corrected.

(f) True lubricant metering. Quantity of lubricant delivered to one bearing is not dependent on any other valve in the system.

(g) Much easier to spot and correct trouble.

Check with your Farval Representative and see how these versatile systems can improve production operations — reduce costs. Or write for free Bulletin 26-T containing complete engineering information on Farval Dualine systems. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company
A subsidiary of Eaton Manufacturing Company



Don't Overlook Standardization

Survey Shows Small Investment Can Pay Big Dividends

An investment of each \$1 in standardization programs can pay \$6 or more in savings, the American Standards Assn. says.

But many companies are still unaware of the possible benefits from such a program.—By G. G. Carr.

■ A return of \$6 for each \$1 invested sounds good in anybody's language. And a new survey shows use of standards is bringing even greater dividends to many metalworkers.

The American Standards Assn. says industry averages savings of \$6 for every \$1 invested in standards activities. And two companies claim a return of \$50 for each standards dollar. Many companies also indicate "large intangible savings" through standards—in some cases these are in addition to demonstrable dollar savings.

Dollar Benefits—Thirty-four companies report specific dollar savings ranging from \$6000 to \$1 million annually. Two companies, a construction firm and a machine tool builder, report the million dollar figure. In terms of sales, the survey shows savings range from 0.3 pct to 5 pct. The average is close to 1 pct of sales.

Many of the companies reporting cash savings also indicate substantial, but uncounted, economies through inventory reduction, faster deliveries, reduced drafting time and the like.

Extra Benefits—One large machinery maker goes further: "Aside from reduction of stock items, the greatest benefits of a standardization program are largely intangible. One

cannot measure in dollars the countless petty arguments, needless conferences, and time-consuming searches through catalogs eliminated through standardization.

"As a training device for new personnel to obtain performance in a minimum of time, the standards manual cannot be surpassed in effectiveness. Direct effects on consistency of high product quality and benefits obtained in reduction of scrap are not measurable in a tangible sense."

Program Costs Vary—A significant finding of the survey, ASA feels, is that 30 of the 34 companies reporting dollar savings also report extensive use of standards and standards manuals. "This seems to indicate that there is a close link between organized standards work and recordable cost savings," ASA notes.

Costs for standards activities vary

widely on survey replies. Largest figure is \$420,000 reported by a communications company. An aviation company reports its annual budget is \$200,000, and an electrical company spends \$157,000 on standards.

\$25,000 Is Mean—Six companies report intensive standards activity without putting price tags on their programs. "From the size of their programs, however, it appears conservative to say that several of these companies probably spend even more on their standards activities than the communications company mentioned above," comments ASA in the survey report.

Smallest budget reported is \$500. A mean figure is about \$25,000 since almost half the budget figures fall between \$20,000 and \$30,000. Breakdowns show little pattern on how money is spent, other than the predictable fact that salaries account

Standardization Pays Dividends

Sperry Gyroscope Co. cites these examples from its operations:

1. Standardization on a time delay relay saves \$20,000 per year.

2. Revision of electron tube specifications results in savings estimated to be \$150,000 annually.

3. Issuance of a riveting standard yields a minimum annual saving of \$25,000.

4. Development of a low-cost microwave plumbing finish saves about \$50,000 each year.

for the largest share of the budget.

Most Spent on D & E—Design and engineering account for the widest application of standards, according to the survey. Materials, products and components are second, with purchasing and production about evenly tied for third place.

Other areas of corporate activity receive only occasional mention.

Company Standards Favored—Types of standards most widely used are internal company standards. ASA, trade and technical society standards tie for second place. Government standards rank third, while the only other source of standards named is "customers." International standards (International Electrotechnical Commission and the International Organization for Standardization) are "rarely" used.

While it is often desirable to have a centralized standards department, many firms apparently find this unnecessary. Substantially more firms report a formal standards program than indicate a centralized department.

Industry Unaware—Although ASA warns that its survey is not definitive, the organization feels the study establishes that American industry as a whole knows very little about the cost and extent of standardization.

About 2800 companies were queried in the survey and answers were received from 238. Of those replying, 209 reported varying degrees of standards activities, with 89 having recognizable programs. Only 34 of the 89 were free to report actual dollar savings.

Many Miss Benefits—Despite the substantial economies uncovered by survey, ASA sadly concludes that "a majority of companies are missing the benefits of a standards program and of budgetary control of standards work."

But there is a strong indication that more companies are becoming aware of potential benefits. Some companies are only now beginning discover standardization.

Copper Ready to Settle?

"Encirclement" Tactics at Work

As part of Steelworkers' move to encircle steel, a copper settlement becomes likely. Only details remain to be thrashed out.

■ Before the steel hassle gets off home plate it may be tagged out by a copper settlement. An agreement could be that near.

Last August, the copper industry was shut down in a fight that had steel strike overtones. Involved are the Steelworkers' union and the International Union of Mine, Mill and Smelter Workers.

Last week at Salt Lake City, Kennecott Copper Co. people and the Steelworkers were hammering out a final agreement that would result in a reasonable wage-fringe package and an amiable work rule settlement.

The full agreement was being held up last week by a few minor disagreements which were chicken feed compared with major accomplishments. The last minute hassle was over retroactivity.

Surprise Offer—Some time ago, the Steelworkers were surprised by Kennecott's offer of 17.9¢ an hour over a two-year period. The offer came just when the union was saying no one was negotiating with them. Coupled with this offer was a demand for work rule changes. Eventually, things went from bad to worse.

Suddenly, about 10 days ago a copper settlement became a possibility. This was in line with David J. McDonald's attempt to encircle the steel industry. But as it turned out, it was good bargaining between Kennecott and the Steelworkers.

The Terms—The agreement will probably run for two years. Its wage-fringe hike will be about 22.3¢ an hour over a two-year period. There will be no 2-B clause in the contract. Both sides will take serious and close looks at work rules to see if they can agree on over-due changes. Only something unforeseen could get in the way of agreement.



READY TO GO: Western mines may soon be operating if settlement comes. Only minor disagreements remain.

Behind Industry's Last Offer

Union Won't Give on Work Practices

Secret offer and rejection by the union are disclosed in the industry's bid for support.

McDonald is a captive of the union on 2-B in the sense that the locals are determined not to yield.—By Tom Campbell.

■ The steel industry's highly publicized offer disclosed last Thursday was actually made and rejected four days earlier in secret meetings between top negotiators.

This was the basis for The IRON AGE's statements (Nov. 19) that steel negotiations have been stepped up in the form of secret meetings, but that the meetings did not bring both sides close enough together to cause a surge of optimism.

No Choice on 2-B—The detailed offer included some changes in the economic points and modification of the industry's stand on the critical 2-B issue. (See box.) But it was immediately labeled "the same old package, re-arranged a little bit in form" by David J. McDonald, Steelworkers president.

In spite of the modification on 2-B, the fast rejection points out something that insiders have known for weeks: While Mr. McDonald still has control of the union at large, he has lost control over any negotiations on the work practices.

Men Are Militant—He is literally a captive of the locals, local officers, and the executive committee who insist that there be no give at all on 2-B. In other words, it would be Mr. McDonald's neck if he gave in to the language demand of the companies.

"The job they eliminate may be mine," is still the slogan of the more militant men in the union. Some steel management people refuse to believe it, but the evidence indicates that it is.

The union will take the stand that the first two-man committee to study the language is only a "stay of sentence" of the three-man "final and binding" arbitration.

Get Out the Vote—The publication of the offer, after it had been turned down, is the opening of what has been billed as the biggest industrial public relations battle in history aimed at an eventual Taft-Hartley vote on the industry's final offer.

Mr. McDonald has his back to the wall on the economic issues as well as 2-B. If he does not get something similar to the Kaiser contract, he could be accused of selling the men out with a sweetheart contract.

Back to Washington—That's why pessimism is back again in the steel labor hassle. The next move is up to Joseph F. Finnegan, Federal Mediation chief, who will probably set up meetings in Washington shortly af-

ter Thanksgiving Day.

Chances of a settlement depend on what both sides think Congress can or will try to do. Advance reports indicate Congress can and might go overboard on the steel strike. It is believed by some that the injunction will be extended and that Congress will instruct the President, through legislation, to appoint a fact-finding board with teeth of "recommendation—or else."

But there is still the chance that Roger M. Blough, chairman of the board of U. S. Steel, and who had a secret meeting with Mr. McDonald two weeks ago, may alter the policy of his negotiating committee.

Unless he does, the whole shebang will go to election.

Again, the divide and conquer strategy has come up. Wheeling Steel, which does not have a 2-B clause, made its own, independent offer on economic terms similar to the industry's.

Companies' Latest 2-B Offer

1. The union agrees to cooperate and encourage members to cooperate in all reasonable steps to improve efficiency and eliminate waste, with due regard for welfare of employees.

2. In return, and without prejudice to provisions of prior basic contract on local working conditions, companies agree to renew such provisions for the period of the new contract, subject to the following:

A two-man committee, one from each side, will initiate a study of:

What, if any, changes should be

made in the local working conditions provisions . . . to improve efficiency and eliminate waste with due regard for the welfare of employees.

Avoidance of undue work burdens, and, to extent practicable, the retraining and placement on available jobs in the plant of any worker affected by such steps.

The committee will complete its study and submit it to the parties by June 30, 1960. If they then fail to reach agreement, the question will be submitted for arbitration, which will be final and binding.

Oil Country Goods: Short But—

Suppliers See Buyers Market Coming

Because of the strike, users of oil country goods are scrambling for supplies.

But with drilling operations falling below hopes, the long-range outlook for steel producers is not encouraging.

■ Right now buyers of oil country goods are clamoring for supplies. But, looking beyond this strike-caused scramble, makers of oil country goods are not encouraged.

The short-term market may belong to the sellers, but a coming buyers market is likely. One oil country sales executive, John E. Timberlake, vice president, sales, Jones & Laughlin Steel Corp., chided oil men about the outlook:

"The long-term supply of tubular products is an area where the cat seems to be on your back—not ours."

Less Than Predicted—Making it

clear that no supplier should expect a guaranteed market, Mr. Timberlake nevertheless reminded oil producers that their needs had fallen far short of their predictions.

"In 1958 you hoped to drill 62,700 wells but actually drilled 49,100 wells," he said. "In 1959 you may drill 50,000 wells against the previous forecast of 66,000."

Second Guessing—The unhappiness of steel men is not just a question of a market dip. Forecasts for the next 10 years are being revised downward by oil producers. Three years ago it was estimated domestic drilling would hit 85,000 wells by 1965. Oil demand was expected to reach 13 million barrels a day in the same year.

Now one major oil producer (in a minority view) is saying consumption will be only 11.3 million barrels by 1965 and domestic drilling will never again reach the 1956 peak of 58,000 wells.

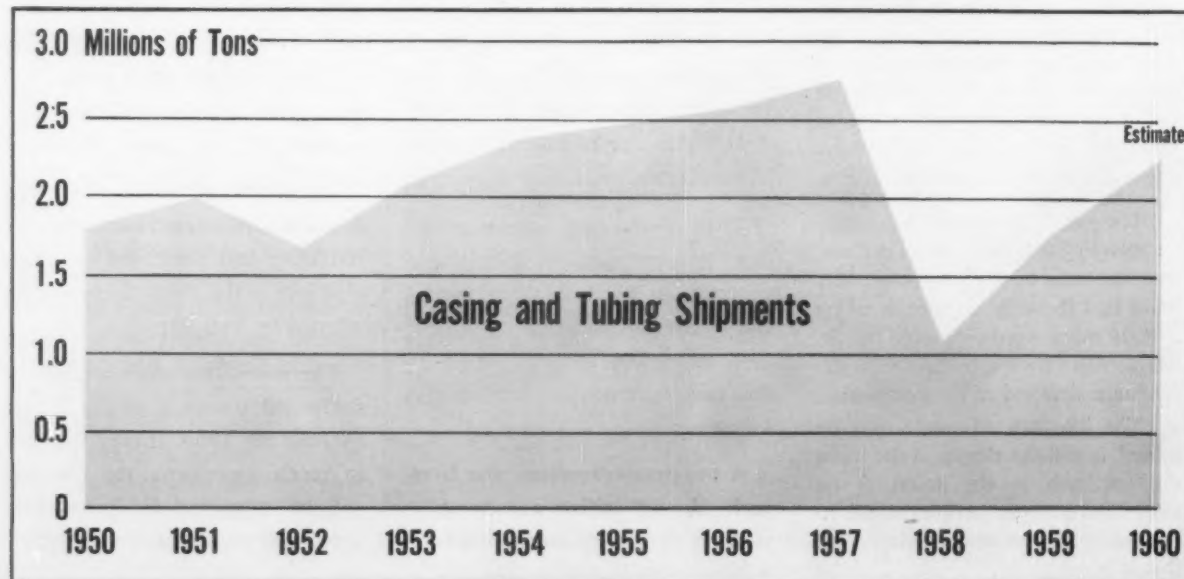
Tax Troubles—Moreover, new tax laws could bring further reductions in drilling schedules. If depletion allowances are completely eliminated, domestic drilling will drop 30 to 60 pct, says one oil man. Modification of the tax law could knock 20 pct off drilling rates.

For next year, cutbacks this size would drop domestic drilling rates from the 50,000 wells expected to anywhere from 25,000 to 40,000 wells.

Slower Growth Rate—In part, the oil problem is one of demand. From 1923 to 1956, U. S. demand for petroleum products increased at the rate of about 5 pct a year. Over the last four years, domestic consumption has leveled off at around 8 million barrels a day. Oil men now see long-term market growth at the relatively slow rate of 2 to 3 pct a year.

Steel producers are in no rush to build pipe mills. According to one estimate, there is enough capa-

Will Oil Country Goods Comeback Last?



city to support a drilling rate of 65,000 wells a year. Mr. Timberlake says oil predictions indicate it will be 1965 or 1967 before oil country demand catches up with seamless capacity.

Different Views — Other pipe producers are less conservative. One mill looks for a normal drilling rate of 65,000 wells a year in the 1965-70 period and a peak rate 25 pct above this average. The same mill feels there will be a need for added capacity. It points out there is a wide difference in the thinking of oil men about the future.

Anxious Buyers—But there's no question about the present tight supply situation for oil country products. Casing and tubing users have reported trouble putting their hands on special analyses of tube or specific sizes for four weeks. They're hammering on mill doors-demanding to know how much they'll get, and when.

Pipe reserves in the oil fields are already at a low point. One supply company reported at the recent American Petroleum Institute meeting that its stocks have dropped from the normal 60 days to just about zero. Much of the heavy drain occurred in the past four weeks. (Oil country supply companies perform the function of service centers in holding a reserve of steel products).

Why Users Worry — Mills insist they'll have tubing and casing for January and February delivery. But some canny oil country goods buyers point out:

Some mills went into the strike with carryover orders of as much as 60 days undelivered casing and tubing. These must be cleaned up before new orders can be filled.

Mill executives themselves admit it will be at least 60 days after mill start-up before there's a regular, organized, schedule of shipments.

Oil country goods buyers have been buying less than the usual 44 tons of steel per well drilled, for both the 1958 and 1959 seasons.

Boost Steel Output With Natural Gas

Electric furnace steel producers find they can increase output by 25 pct by adding natural gas.

The process also works in blast furnaces where it raises iron output by 20 pct.

■ Electric furnace steelmakers are watching first reports that additions of natural gas and oxygen, during meltdown, will increase output of existing electric furnaces by 25 pct. One mill has expressed the belief that it can score a 50 pct tons-per-hour increase in its electric furnace output by using the combination.

December is expected to see release of information on a burner unit designed for electric furnace use that will inject both oxygen and natural gas. At least 10 electric furnace operators are already experimenting with natural gas-oxygen additions during the meltdown period or are preparing to install burners in their electrics. Installation costs are low, returns high.

Use More Oxygen—Electric furnaces already use quantities of oxygen for decarburization of molten steel. Oxygen is injected by roof lance or through the doors of a front charging furnace. The period of injection is short—usually in the neighborhood of 20 minutes. Carbon content is reduced roughly one point per ton per minute.

But electric furnace men now foresee injections of natural gas and oxygen during the entire meltdown period. It will range from as short a time as 45 minutes to as much as three hours, depending on the size of the furnace and current input. Excessive decarburization can be halted by additions of low cost, high carbon scrap.

Case History—In one case history, an electric furnace producer hit an output of 30 tons per hour. With the addition of gas and oxygen, the test furnace could hit 45 tons per hour. By adding iron ore, to promote an exothermic furnace reaction, it is regarded as likely that output can reach 50 tons per hour.

However, some mills using exactly the same output would hit only 24 tons per hour. Conservatively, an oxygen-gas addition could boost their furnace output to 30 tons per hour.

Credit Where Due—Proponents of oxygen-natural gas additions to the electric furnace point out that the economics of the process are still capable of further gains. Where natural gas is unavailable, the use of liquefied petroleum gas (bottle gas), atomized fuel oil, and even powdered coal, are under study or test.

Credit for considerable development work in the new output-boosting technique is given to Linde Air Products and National Carbon, both divisions of Union Carbide. The technique is new enough that a substantial number of electric furnace steelmakers are unaware of the work.

Blast Furnaces, Too—Blast furnace men are equally enthusiastic about natural gas. J. E. Timberlake, vice president of sales, Jones & Laughlin Steel Corp., says a blast furnace run by J&L confirms U. S. Bureau of Mines reports that a 5 pct addition of natural gas to the blast can boost iron output by 20 pct, cut coke use by 30 pct. At least four U. S. mills are checking the results in their own operations, and one Mexican blast furnace is experimenting on the process.

From Rocketry to Industry

Space Developments Find Down-to-Earth Uses

Newest materials and methods to conquer space were displayed at the Rocket Society meeting.

Many have excellent possibilities for earth-bound industry.
—By F. J. Starin.

■ "We can look forward to startling and significant achievements in metallurgy, to new materials and superalloys. . . . These should have profound effects on industry and on the tools and techniques of manufacture."

Sen. Warren G. Magnuson (D., Wash.), was talking about our space program when he said this to the American Rocket Society at its annual meeting in Washington, D. C. last week. But it's already a fact

that many things developed specifically for rockets and missiles are finding important uses on the ground.

For Far or Near—For instance, the Atlantic Research Corp. displayed some of its small control rockets. Each was developed to do a specific job in a specific missile, rocket or satellite. But under each unit displayed was a suggestion for possible commercial application.

Wyman-Gordon Co., forgers of Worcester, Mass., introduced a new, high temperature, superalloy at the meeting. The very name—Astroloy—indicates its objectives. "Operating temperatures of missiles and jet engines can be increased by as much as 200 degrees, which in turn means increased power and greater payloads," explained M. E.

Cieslicki, W-G research director.

Design Idea?—But he also said Astroloy could do a job in down-to-earth uses. He felt this was a big enough development to prompt turbine builders, for instance, to completely redesign around the alloy.

Some advance work on cryogenics, (materials that will operate in ultra-cold temperatures), is being done for the space program. Much of this will be of direct interest to metals producers and fabricators who have an eye on the fast-growing civilian side of this market. Linde Div., Union Carbide Corp., is doing extensive work on physical properties of cryogenic fluids, and designing storage containers.

Talent Ready—In some cases, procedure from missile to civilian uses is also reversed, and the whole thing becomes a large, profitable circle.

A spokesman for Loewy-Hydro-press Div., Baldwin-Lima-Hamilton Corp. explained that the company had assembled the engineering talent in building its heavy equipment lines, so it was no problem to shift into missile handling, launching and tracking equipment.

Some others: Boeing Airplane Co. is doing extensive work on controlled atmosphere brazing, General Electric is working on arc spraying of refractory metals, CTL, division of Studebaker-Packard Corp. is working on high temperature insulations.

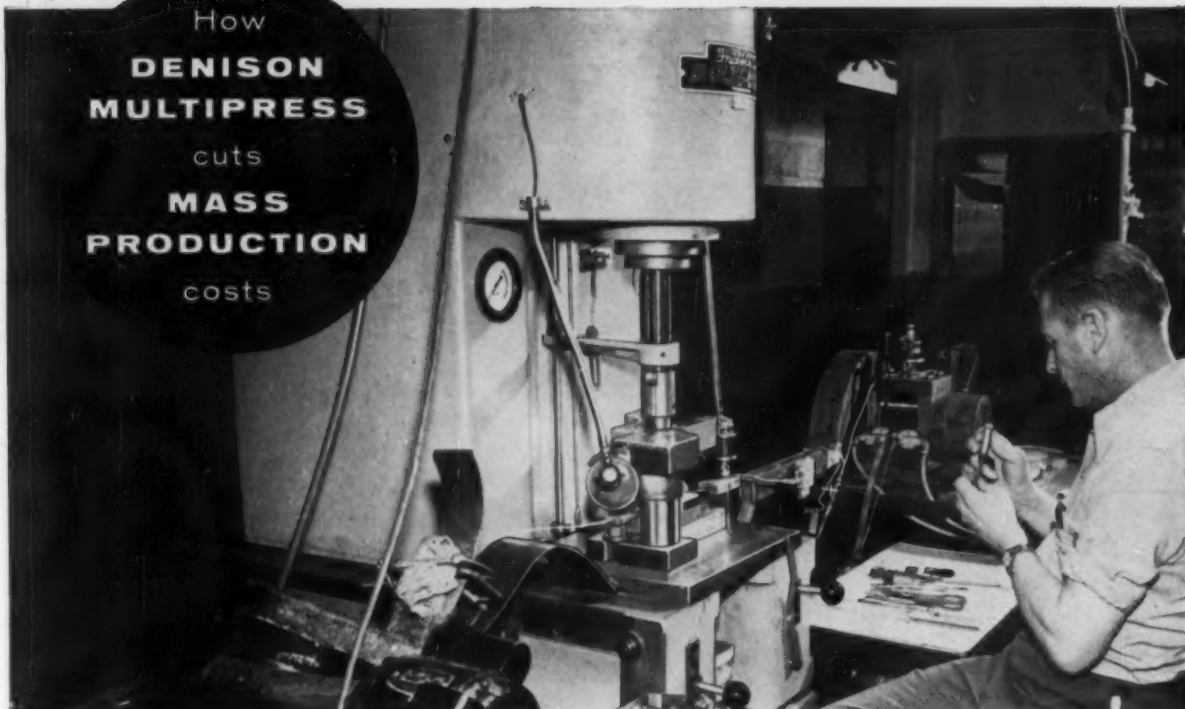
Developments for civilian industry will slightly trail the progress of space programs.

What can we expect in the near future? M. J. Neder and T. E. Walsh, Aerojet-General Corp. figure "unmanned-soft landings (on the moon) with return flight could occur in the mid-1960's."



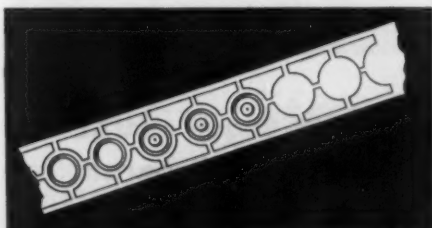
MORE AND FARTHER: This all-beta titanium forging, made by Wyman-Gordon Co., on its 50,000 ton closed-die press, is a missile motor casing closure. Company says it will boost the missile's payload or range.

How
**DENISON
MULTIPRESS**
cuts
**MASS
PRODUCTION**
costs

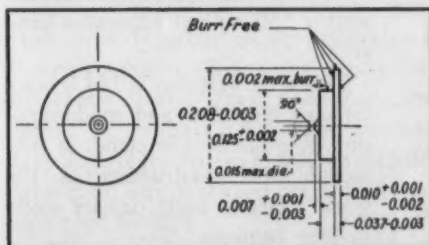


HIGH-SPEED LOW-COST COINING WITH HYDRAULIC MULTIPRESS at Minneapolis-Honeywell. Operating at 225 strokes-per-minute, modified 8-ton Denison Multipress turns out 70,000 magnesium buttons a day. Automatic controls and safety limit switches permit one operator to handle 3 Multipress lines.

How **DENISON** hydraulic Multipress saves cash on high-speed coining for **MINNEAPOLIS-HONEYWELL**



3-STAGE PROGRESSIVE DIE advances strip .4375" with each $\frac{3}{4}$ " Multipress ram stroke. Holes are used for piloting—and for stock advance with hitch feed.



EXTRUDED, COINED AND BLANKED from pure magnesium strip—this button is mass-produced at *extremely low cost* on Multipress. Stock sizing rolls control thickness of strip fed to die. Denison hydraulic Multipress controlled pressure easily holds necessary precision tolerances.

High-speed coining of small magnesium buttons is normally a mass production job for an automatic screw machine. *But, Minneapolis-Honeywell found it could do the job better and faster...save money, too...with Denison hydraulic Multipress.*

A modified 8-ton Multipress—equipped with 3-stage progressive die, 6-ton cylinder and special high-speed valves—mass produces about 70,000 of these ordnance-item buttons per 8-hour shift. Coining and blanking the buttons from coiled strip stock with Multipress—instead of using bar stock and a screw machine—*cut costs significantly on the operation.*

The progressive Multipress die—designed by Minneapolis-Honeywell engineers—has 3 working stations. *First station* pierces triangular holes which relieve strip and permit proper impact extrusion. *Second station* extrudes and coins parts to size—but leaves them intact in the strip. *Third station* blanks parts and moves them through the blanking die into waiting containers.

This is typical of hundreds of jobs that Denison Multipress does today throughout industry...to give users the *competitive edge*.

Denison hydraulic Multipress means important *plus benefits*, too—longer tool and die life...less scrap...better quality-control...minimum maintenance...greater operator safety.

Isn't it time you got the story on Multipress...complete line from 1 to 75 ton capacities. Call or write your Denison Hydraulic Specialist on your very next job.

DENISON ENGINEERING DIVISION

American Brake Shoe Co.

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A Heavyweight Gets Examined



CLOSE LOOK: A 13,200 lb zirconium ingot gets a surface examination at the Niles, O., plant of Mallory-Sharon Metals Corp. The ingot was melted from zirconium chunklets produced by the company's sodium reduction process.

Ford Drops Edsel After Two Years

After two years of marketing frustration, Ford Motor Co. is dropping the Edsel. The company said today that low demand for the car this fall—at a time when sales of its other makes are soaring—prompted the decision. The company said the steel shortage was another factor in withdrawing the Edsel from the market at this time. Steel normally used for the Edsel now will be used to produce other lines.

The name of Mercury-Edsel-Lincoln Div. as a result, has been changed to Lincoln-Mercury Div.

End of the Line—Edsels have been assembled at Louisville, Ky. The last Edsels are expected to come off the line this week. The

company said there probably would be no layoffs because of the suspension of Edsel operations. Louisville also builds Ford cars and trucks.

Ford said there is no connection between dropping the Edsel and the fact it will introduce a "medium-price" economy car—the Comet—next spring.

Since 1960 models were introduced, Edsel's share of U. S. new car sales has been fractional—less than 1 pct. Since the first Edsel was built in July, 1957, only 111,000 have been turned out—by model year 1958—63,000, 1959—45,000, 1960—3000. The car was a marketing disappointment from the beginning. Its popularity decreased steadily.

Ford Motor Co. says the Edsel's absence won't leave a hole in its

pricing structure. It had been competing with the top-priced models of Ford and lower-priced models of Mercury.

Great Lakes Freeze-Up May Cut Ore Shipment

An early freeze-up in the Great Lakes area is sinking hopes of iron ore carriers for an extended shipping season to make up time lost in the steel strike. And foreign cargo ships are hurriedly putting out for home to avoid getting trapped.

The Ninth Coast Guard District in Cleveland last week dispatched the icebreaker Woodrush to the harbor of Ashland, Wis., to assist two ore boats attempting to maneuver in 6 in. ice. Duluth, Minn. harbor already has 6 in. of ice and 4 in. is reported at Green Bay, Wis. At mid-week there were 23 boats in Duluth harbor waiting to take on ore and 17 more ships anchored outside. Ore is moving down from the mines slowly because of the freeze-up. Even southerly Toledo, O., harbor is closed to small boats.

However, most boats that want to get out of the upper lakes should be able to.

Work Begun on J&L Expansion Program

Workmen have begun clearing ground at the Cleveland Works of Jones & Laughlin Steel Corp. to start a \$50 million expansion program.

This is the first step in J&L's newest cost reduction and modernization program at Cleveland. It will include the construction of the world's largest basic oxygen steel-making furnaces.

The furnaces, which will initially have a monthly rated capacity of 100,000 tons, will replace eight openhearth furnaces built in 1924. The basic oxygen furnaces will produce 200-ton heats.



"Yellow Strand Flattened Strand Outlasts Conventional Wire Rope By 35%"

Ellroy King, President — Halliburton Portland Cement Company

How does Halliburton Portland Cement Company, Corpus Christi, Texas feel about Yellow Strand Flattened Strand? Hear what President Ellroy King says: "We've used B & B rope products for 4 years, and find them to be highly satisfactory. Flattened Strand on our overhead crane outlasts conventional wire rope by 35%."

Halliburton specifies Yellow Strand Flattened Strand Wire Rope to take the jerk, shock, fast directional changes and rapid flexing on their clam's

holding and closing line. The 4-yd. clamshell bucket unloads and rehandles 320 tons of wet oyster shell per hour. The 1" 6x30 Yellow Strand Flattened Strand closing line gives 6 to 8 weeks service, where conventional lines had to be replaced every couple of weeks. A substantial savings in rope costs . . . reduction in downtime . . . and increased production!

To find out if you, too, can reduce operating and replacement costs by switching to Yellow Strand Flattened Strand, call *your* Yellow Strand distributor!

BRODERICK & BASCOM ROPE CO., 4203 UNION BLVD., ST. LOUIS 15, MO.

Yellow Strand®



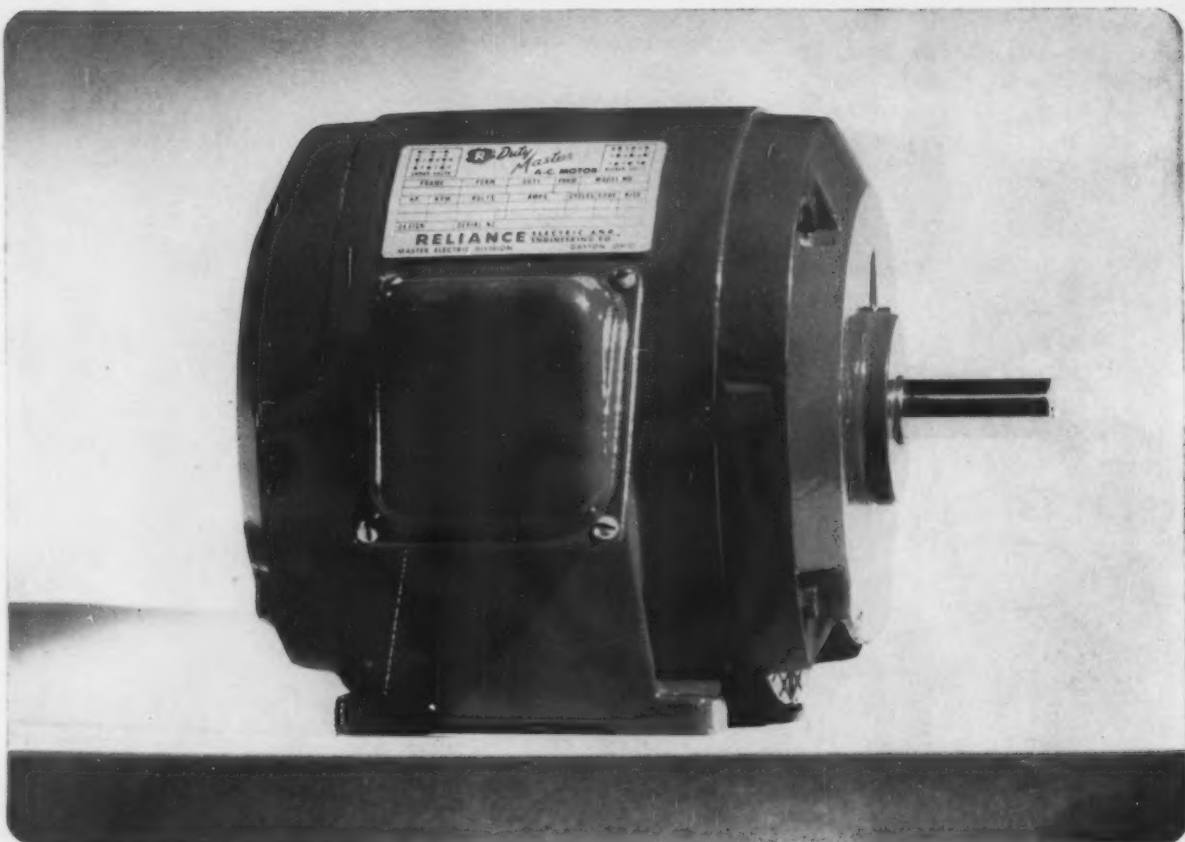
WIRE ROPE



SLINGS



CLIPS



DUTY MASTER

a brand new a-c. motor

Product of Reliance Electric and Engineering Company and its Master Electric Division, Duty Master's new design gives users better protection from the inside out, simplified lubrication, better response and improved all around performance. The Duty Master line, from protected open, to totally enclosed, explosion-proof, 1 to 250 hp., is ready for delivery **NOW**.

Duty Master's insulation, by means of a series of multiple dips and bakes in thermosetting varnish plus final protection in finishing enamel, makes it resistant to water, acid, dirt and other contaminating elements . . . adds years to motor life.

"Metermatic" lubrication regulates flow of grease to the bearing—provides automatic grease relief. No danger of over-or under-lubrication . . . no maintenance headaches.

Duty Master's low inertia rotor has faster response in starting, stopping and reversing. This, plus better ventilation and increased accelerating torques, permits frequent starts and stops without over-heating.

Duty Master's new design proves conclusively that all a-c. motors are *not* alike . . . that this new motor gives users the best value in industry today.

Call your Reliance Sales Engineer or distributor—listed in the Yellow Pages—for the complete story, or write for Bulletin No. B-2106, Reliance Electric and Engineering Company, 24701 Euclid Avenue, Cleveland 17, Ohio.

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REEVES



Harvey Jacobson

Automation Led to His Success

Harvey Jacobson started his nut manufacturing firm 10 years ago. His plant was a garage and he had only a few employees.

Today the firm is grossing \$2.5 million in sales annually and is turning out 100 million nuts a month.

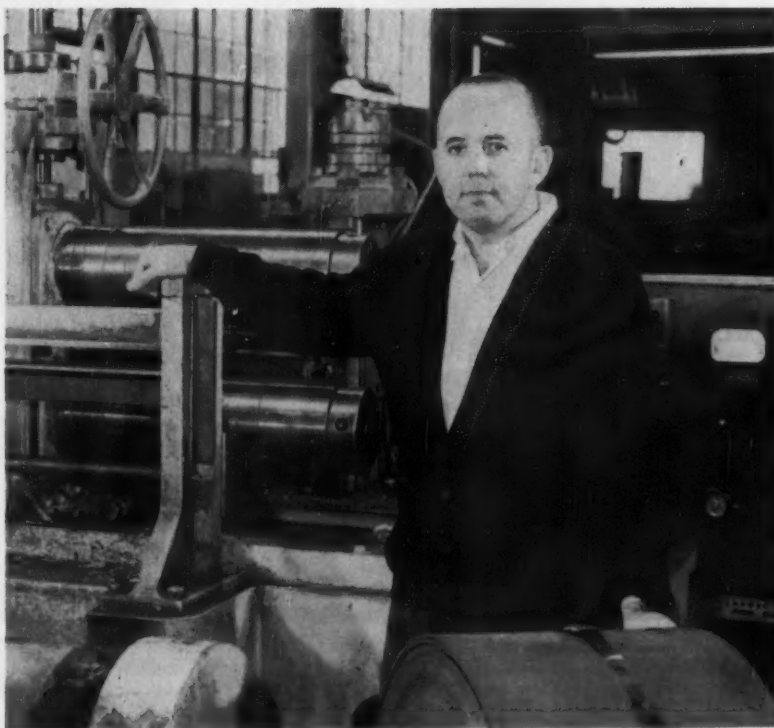
■ It has taken Harvey Jacobson, president of the Jacobson Nut Manufacturing Corp., only 10 years to turn a very small operation into a \$2.5 million a year business.

With little more than a belief that there was room for improvement in the production of a nut, he started his firm in 1949. His plant was then a small garage and he employed only a few men. He produced a line of standard and self-locking nuts. At the end of the first year he grossed \$25,000 and some definite ideas about how nuts ought to be made.

Finds the Answer—From the beginning, Mr. Jacobson, a shirt-sleeves engineer, was convinced that the road to competitive success was paved with improved, automated production machinery.

With this in mind his engineering department (of which he is still a working member) was directed to come up with new machines. Mr. Jacobson wanted them to perfect and construct equipment that would automate the nut manufacturing process and cut costs. This machinery, he says, is what made the big difference.

They were responsible for a rapid production increase and, as Mr. Jacobson wanted, cut operating costs.



HARVEY JACOBSON: In only 10 years he built a big business.

Rapid Expansion—With the production speedup, more employees were hired and the garage operation had become obsolete. This year, in a new six-acre plant in Kenilworth, N. J., Jacobson built machines poured out a record 100 million nuts. This high rate of production accounted for a gross sales volume in excess of \$2.5 million—a 100 pct increase in almost 10 years.

To meet the demands of his growing operation Mr. Jacobson is in the process of establishing a new warehouse in Los Angeles. For the time being it will be used to distribute Jacobson products faster to West Coast users. Eventually the facility will be turned into a

production plant and again production will be greatly increased.

M.I.T. Alumnus—Mr. Jacobson, a graduate of the Lowell Institute School of Massachusetts Institute of Technology, began his career as a methods and planning engineer for General Electric Co.

During World War II, he was an engineering officer in the Maritime Service. He served in India and the Far East. He also worked for a time as a toolmaker at the Watertown Arsenal, Watertown, Mass.

He is a member of the American Society of Mechanical Engineers and the New York City M.I.T. Club.



PRECISE GAUGE CONTROL

to your restricted specifications with **J&L Cold Rolled Strip Steels**

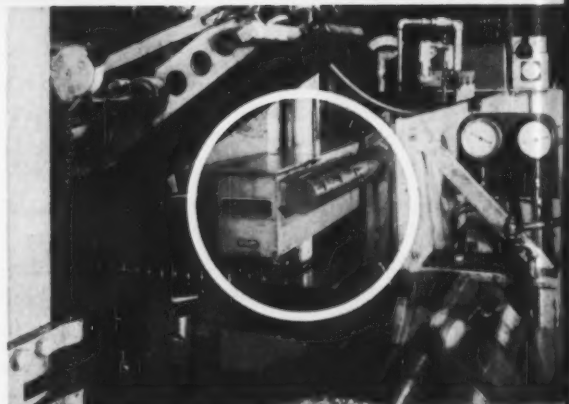
In many critical applications, precise gauge control yields worthwhile savings on production costs. Not only does it mean increased tool life but it eliminates grinding for gauge accuracy and reduces quality control costs by minimizing inspection schedules.

At J&L, specially designed cold mills make it possible to exercise precise gauge control—to your specifications. J&L processing techniques include the use of AccuRay gauges to provide exact measurements during rolling. Gauge accuracy is just one of the many restricted specifications which can be met consistently by J&L.

J&L offers you an experienced organization devoted to strip steel processing combined with fully integrated production facilities.



For your convenience, precision strip facilities are available to you in our plants at Youngstown, Indianapolis, Los Angeles and Kenilworth (N. J.)



Typical of J&L precise control is this AccuRay thickness gauge to help assure tolerances on cold rolled strip steels.



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TEMPERED SPRING STEEL • ZINC AND COPPER COATED

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Tight Money Will Stay Tight

You can't count on any easing in the present credit pinch for some time.

Strong demands for borrowed funds will continue from many sources well into 1960.

■ There's little prospect the tight money squeeze will ease. The credit pinch tightened up in the third quarter. Demands for money pushed up borrowing rates at commercial banks. Other interest charges followed suit.

Even the steel strike, which put a temporary halt to borrowing to buy steel supplies, had only a little effect on credit demands. Some interest rates did taper off in late October.

Renewed Demand—But, once the mills resumed in November, the press for money was on again. Steel users need funds to rebuild inventories. There are other credit demands to meet additional back-to-production needs.

As a result, when the U. S. Treasury went into the money market to sell securities last week, it paid a new record interest rate on short-term offerings. (Because there was more competition for funds, the Treasury bills were in less demand. So higher interest rates had to be given buyers.)

Continued Pressures—In the months ahead, the credit outlook is not any brighter. With steel in limited supply, money to rebuild inventories will be needed well into 1960.

Capital spending will also soak up credit. Some observers believe capital investment next year will top the record \$37 billion spent in

1957. Some of this money will come from company earnings and depreciation allowances. But business borrowing will be large.

Personal spending (which rose during the strike) is expected to set new records next year. With this will come advances in consumer credit for autos, housing, and other durables.

Outlook for '60—All the evidence points to a continued tight

money market during much of 1960. Albert T. Sommers, director of the Division of Business Analysis, National Industrial Conference Board, sums it up this way: "The inflationary prospects in the up-trend suggest the Federal Reserve Board will continue policies to restrict the growth of credit. There is a strong chance that interest rates in 1960 will be even higher than their present advanced level."

How Much Has Strike Hurt?

■ When the injunction halted the steel strike, it was 116 days old—the longest on record.

Yet its limited impact on the total economy continues to surprise observers. Within the metal producing and using industries, the effects were great. Even now, with mills operating, some steel consumers are shutting down while waiting for steel.

1959 Versus 1952—But reports from the Federal Reserve Board and the U. S. Dept. of Commerce show how well the economy stood up under the strike.

Between June and October the FRB's Index of Industrial Production slid off only 7 points. From an all-time record high of 155 in June, it dropped (on preliminary estimates) to 148 in October.

During the last serious steel strike in 1952 (only about half as long as the present one) the index fell 4 points between May and July.

Demand Stays Strong—Other third quarter statistics this year are encouraging. It's true the Gross National Product dropped \$6 bil-

lion below the record high of \$484.5 billion in the second quarter. But the total flow of goods and services to buyers increased. Manufacturers' inventories dipped to meet the demand.

Real national output (adjusting for price changes) was higher than during the pre-recession peak in 1957. Personal spending rose \$2 billion above second quarter levels.

Inflation Wipes Out Family Income Gain

U. S. families are making more money than ever before, but inflation is cancelling their ability to buy consumer goods.

This conclusion is drawn by the U. S. Census Bureau in a new report on the income of the nation's families.

Average income of families was \$5100 in 1958. This is 2 pct higher than in 1957. But inflation wiped out the gain, so that consumption of goods and services actually did not expand in relation to the growth in income.

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Off comes the can, for fast addition of the 90-lb. block of Pennsalt AE-16 S to the immersion tank.

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How a Broadened Product Base Can Ease Sales Cycles

Cooper-Bessemer's acquisition of Rotor Tool will help smooth out extremes of sales cycles that plague heavy machinery builders.

But it also ties in with plans to extend the company's own product lines.

New products are being developed to broaden its markets in the air tool and compressor field.

■ When one company buys another, it's a fairly sure bet the new combination is formed to broaden or diversify the product line, strengthen an existing market, or invade a new one.

Last month's purchase of the Rotor Tool Company, Cleveland, by the Cooper-Bessemer Corporation, Mount Vernon, Ohio, is no exception to this rule.

The Reasons—Cooper-Bessemer, a leading builder of engines and compressors, acquired Rotor Tool, manufacturer of portable air and high cycle electrical tools. Objective: To enable Cooper-Bessemer to offer both air power and air tools for industry, broadening its product base, and providing the company with a strong entree into the industrial air market.

But equally important to Cooper-Bessemer, and its young president Eugene L. Miller (see cover), is that the Rotor Tool acquisition will help smooth over the steep sales fluctuations, a common headache to builders of heavy machinery.

Peaks and Valleys—Since 1946, when the Cooper-Bessemer Corporation showed an annual sales



MAKING PLANS: Cooper-Bessemer's E. L. Miller and Rotor Tool's H. P. Bailey make plans to coordinate operations after the acquisition.

figure of approximately \$16 million, growth has been steady and occasionally spectacular. In 1959, the company will gross somewhere around \$65 million. But fluctuations as great as \$17 million per year have occurred. It is gullies like these that Mr. Miller and his growth-minded team are seeking to stabilize.

Balancing sales cycles, according to Mr. Miller, is difficult enough even when a company is content to stand pat with an existing market. But since 1956, Cooper-Bessemer has set up or acquired two wholly-owned subsidiaries, has kept up a steady stream of new products. (The latest is a revolutionary gas turbine driven by a modified jet engine to provide stationary power.)

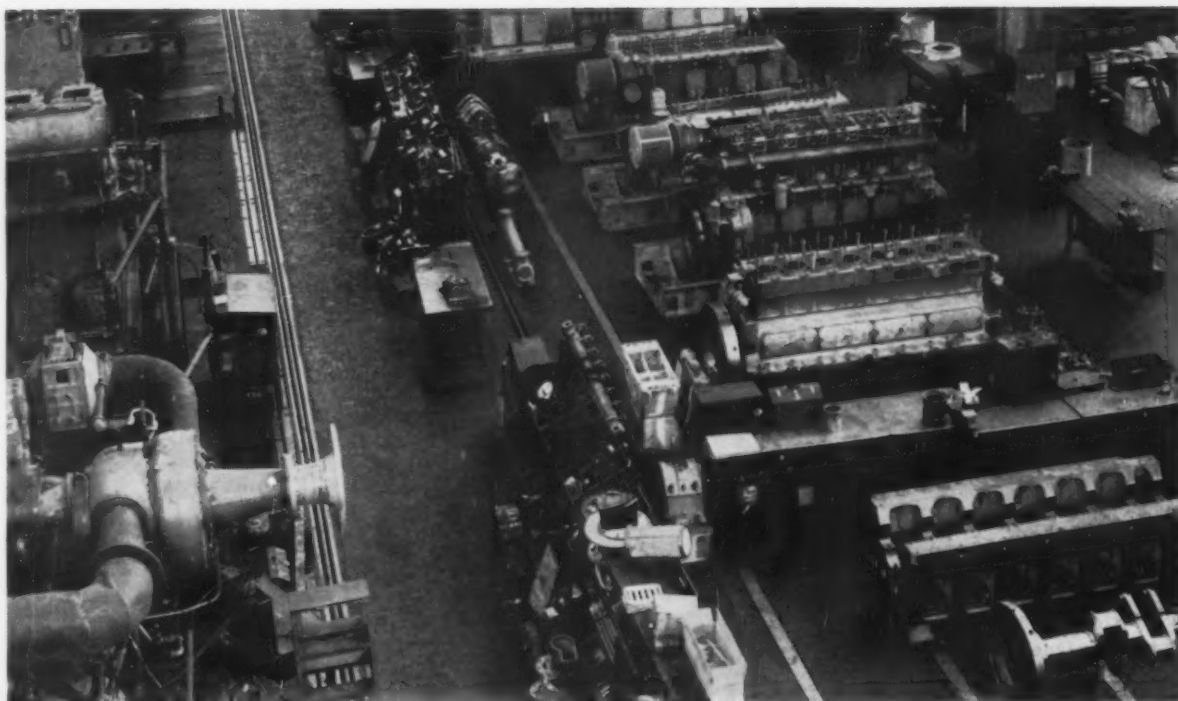
Three Questions — Riding herd on this kind of growth (a ten-year forecast made in 1956 calls for doubling of sales volume by 1965) means constant attention to the

sales cycle of each product and market.

"We look at potential company acquisitions from three basic views," Miller says. "First, will the purchase broaden our product line or strengthen our market position? Second, will the acquisition enable us to show a steady upward curve on our annual sales charts? Last, will it improve our earning power? If the answer to all of these questions is yes, we have a starting point for negotiations."

Why Power Tools?—Rotor Tool, headed by founder Herbert P. Bailey, provided a positive answer to all the questions. The company manufactures portable power tools for a wide variety of "consumer" manufacturing markets, which have a constant need for air and electric tools and their accessories.

Units are manufactured by the thousands, in hundreds of different



EXPANDING: New lines are being added to Cooper-Bessemer's established products like these diesels.

models. With wide demand from the automotive, appliance, aircraft and general industrial markets, sales are spread over the year, and from year to year, with a relatively level volume.

Straight Line Planning—Cooper-Bessemer, on the other hand, builds complex engines and compressors which may cost hundreds of thousands of dollars and take months to build. Unit sales are based on the willingness of industry generally to make major capital investments in any given year.

"In effect," Miller says, "the acquisition of a company like Rotor Tool helps to straighten the line between the sales peaks and valleys characteristic of a builder of heavy machinery."

More Growth Potential — By purchasing Rotor Tool, Cooper-Bessemer is also in a stronger position to continue its "growth-sales stabilization" policy.

"For some time," Mr. Miller says, "our company has felt that users of industrial air, that is air

power used in general manufacturing activities, have been short-changed on systems engineering. Air compressors have been purchased from one source, tools from another, and the systems engineering in between has been ragged, if not non-existent."

To bridge this gap between power and tools, Cooper-Bessemer and Rotor Tool are now completing plans to provide overall system engineering assistance to any air compressor or air tool user.

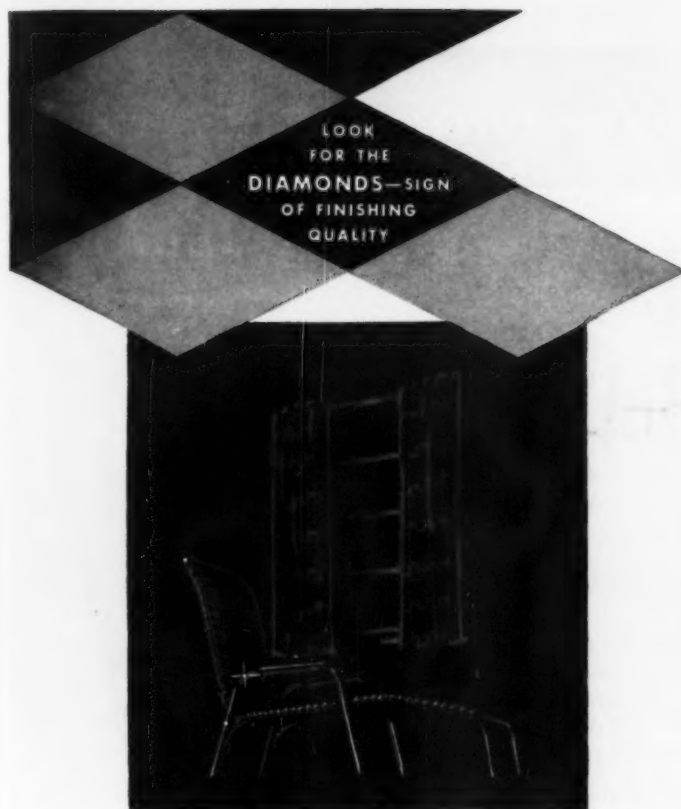
Next Step, Compressors — As a corollary, of course, the company is now in a position to make a strong bid for the metalworking compressor market. Over the past 125 years, Cooper-Bessemer has become one of the world's leading suppliers of heavy duty engines and compressors for natural gas gathering and transmission, and for petroleum and chemical processing and for all stationary and mobile power needs. A comparatively minor share of its overall sales has come from the general manufacturing market.

But coincident with the announcement of the Rotor Tool purchase, Cooper-Bessemer has announced the development of two entirely new, low-horsepower "industrial-type" air compressors which complement the air tool line manufactured by the Rotor Tool Co.

With the general goal of growth, balanced sales and improved earnings, it's likely that Cooper-Bessemer will continue its policy of careful company purchases in areas which will further its new products and markets. But the trend will be toward firms with a strong, non-cyclical sales position.

"In a fiercely competitive field," Mr. Miller says, "balance may prove to be the strongest point of all."

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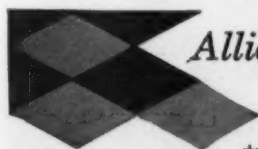
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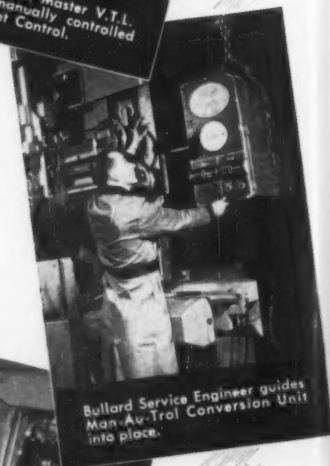
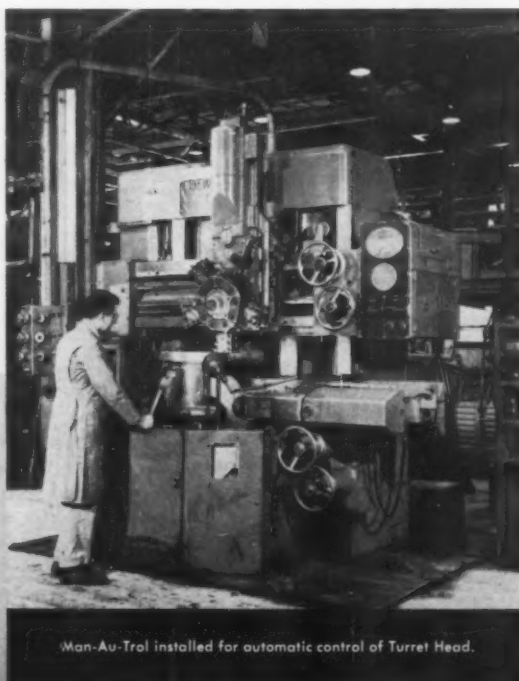
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USSR No Threat in Auto Market

Ford Official Reports on Red Auto Industry

Manufacturing and highways are far below standards needed to sustain a thriving industry.

It will be years before Russia is a threat in the world auto market.—By A. E. Fleming.

■ Russia may know a great deal about missiles. But its automotive abilities aren't nearly as impressive. In fact, the country probably will not loom as a major force in world auto markets for many years.

This is the observation of R. J. Forrest, of Ford Motor Co. Mr. Forrest spent 71 days in Russia last

summer as his company's representative in the American National Exhibition in Moscow.

Tools Lacking—Russia is lacking severely in automotive machinery, production facilities, and skilled labor, he says. "The Western world doesn't have to fear Russian auto competition. The Communists need all the vehicles they can make. Besides, the quality of their products is so poor by modern standards that large-scale exporting is out of the question."

Finland offers an example of the problem Russia is running into. Mr. Forrest learned that Finland must

buy 5000 Russian cars a year under a one-sided trade agreement signed 20 years ago as part of the Russo-Finnish peace treaty. The Finns use a few of the cars as taxi cabs. The rest, because of inferior quality, rust away in fields.

Everybody Walks — Mr. Forrest saw the transportation systems of Moscow, Kiev and Leningrad. He was not excited. He says Moscow has only 25,000 cars, including 5000 taxis, to serve a population of about five million. On the busiest streets, car and truck traffic runs relatively brisk at peak hours.

Subways, diesel buses, electric

World's Most Expensive Smoke

■ According to the prices on the right, auto enthusiasts had better stop spending money on cigarettes if they want to buy a Smoke. The first models of the Argonaut Motor Machine Co. will be available in April 1960. Argonaut engineers have been working on the machine since 1956, and were under orders to come up with the finest motor

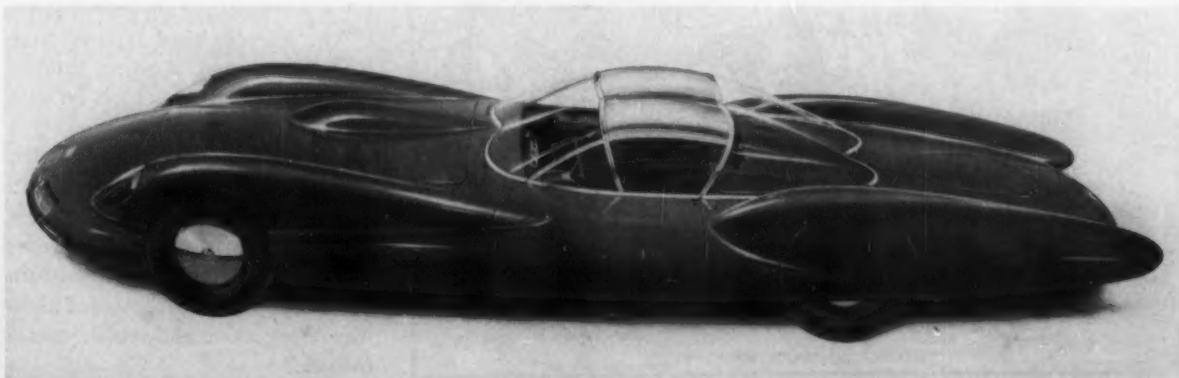
machine possible. It will hit 200 mph, and comes equipped with safety belts and canopy wipers that hide in the body when not in use. For the \$26,000 you'll get a four-year guarantee and free inspection at your residence every six months. Incidentally, financing arrangements can be made directly with Argonaut.

ARGONAUT

The Five Passenger Formal Coupe	\$26,750
The Sedan For Five	26,350
The Sportive Five Passenger Coupe	25,700
The Convertible	25,900
The Steed	25,150
The State Limousine	32,000
The Smoke	26,000

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trams and trolley cars are jam-packed. But secondary streets are bare of traffic. Hoards of people walk down these streets day and night struggling with impossible burdens of all kinds.

No Automation—Except in its biggest cities, Russia cannot operate motor vehicles in volume. There is a complete absence of modern highway systems. Mr. Forrest saw no evidence of planned highway construction. There is no heavy road building machinery. Although there are bulldozers and scrapers, most of the heavy street and road construction, including asphalt laying, is done by hand. A great deal is done by women.

Gorki is the center of automotive manufacture in Russia. But Mr. Forrest visited the Likhachjov Automobile Works in Moscow. This factory is very old. Lighting in the engine plant is poor. Housekeeping is haphazard. Machinery is a copy of ours. Paint booths are open, paint odor is strong and ventilation is bad. There is no automation by our standards. The only piece of auto-

mated equipment in the engine plant is a turnaround machine for cylinder blocks. Factory officials proudly show this to each visitor.

Few Labor Problems—There are no unions in Russian auto plants, says Mr. Forrest. There are what might be termed "company unions." They serve as information liaisons between workers and officials. There are no bargaining rights for the approximately 40,000 workers in the Likhachjov works. They operate on a precise schedule. Last summer they were turning out 350 trucks a day and a few cars on special order.

The enthusiasm the Russian man in the street shows for automobiles is unmatched, according to Mr. Forrest. "We passed out 1.5 million pieces of literature. They grabbed our brochures like they were \$100 bills. They mobbed the exhibit, climbed all over our cars, trucks and tractors. There were constant swarms of people."

Few Available—This is because the average Russian is auto-starved. There is no such thing as private car

ownership in the country. The state is the ultimate owner of all cars. If an individual could scrape up enough rubles to buy a car, the state could snatch it from him at any time. Still, Mr. Forrest heard stories of families pooling their incomes to buy a car. But they wait three to five years for delivery.

The wait is long because there is so little automobile production. In 1958, Russia turned out 122,400 cars and 389,000 trucks. In 1957 the figures were 113,600 cars and 371,600 trucks. This compares to U. S. totals of 4,244,000 cars and 871,000 trucks in 1958 and 6,115,000 cars and 1,090,000 trucks in 1957.

"The Russians love American cars," emphasizes Mr. Forrest. "They consider them the finest in the world. They're shocked when we tell them we produce four to seven million cars a year."

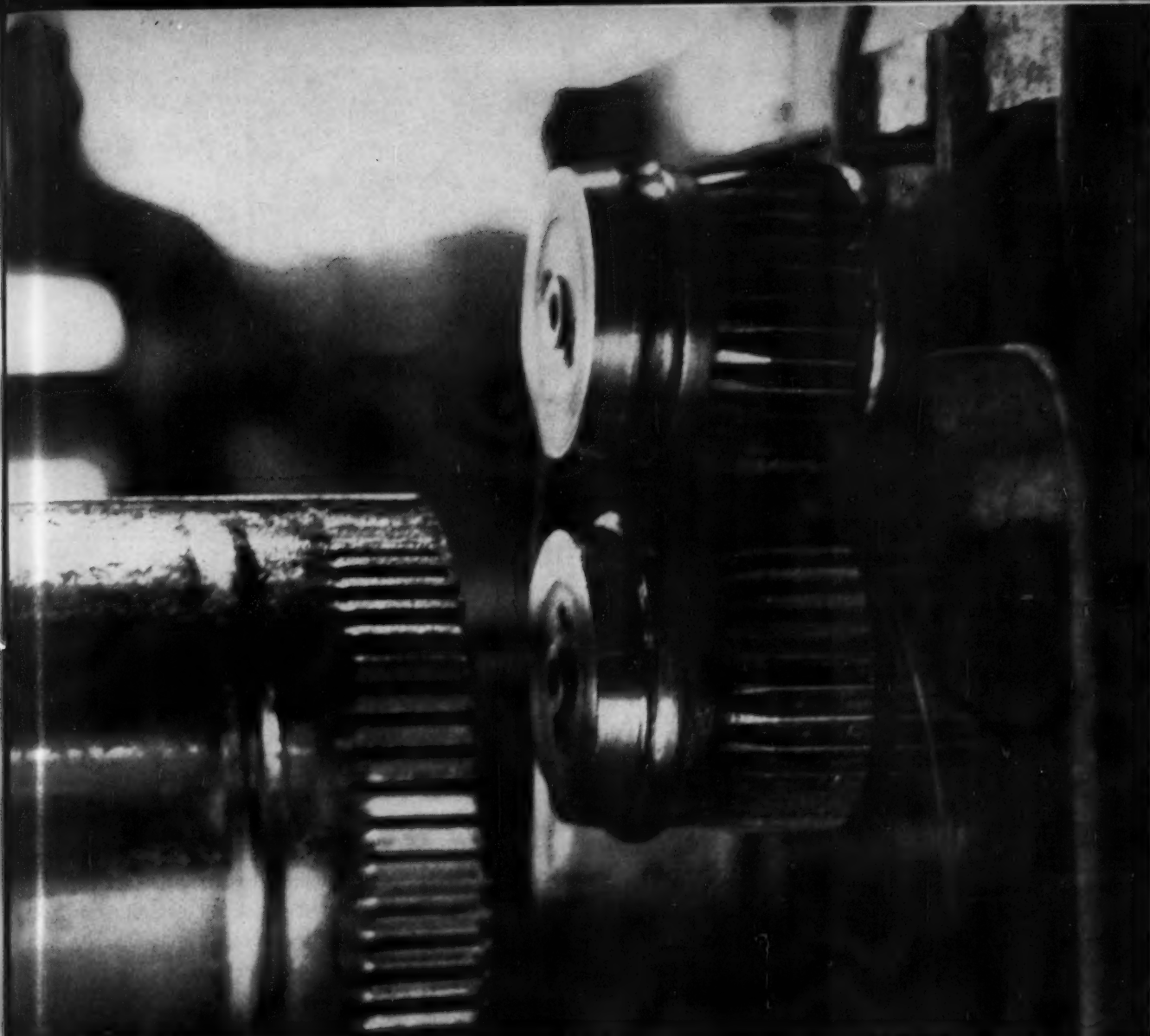
Popular Makes—So far, Communist leaders have shown interest in U. S. cars chiefly to copy them for their own manufacture. Russian cars—the Zil Zim, Pobeda, Volga and Moskvitch—look like 10-year-old American models. Most popular car is the Volga. It's used a great deal for taxi cabs. The Zil is a "prestige" car. It looks like a 1950 Packard. There are infrequent styling changes. However, they now have a prototype of a new model they call the Chaika. It looks like a 1957 Ford.

"It's a miracle how pedestrians can get out of the way," he says. "Sometimes they don't. There are many accidents. This is in spite of the fact that the sentence is severe for a driver who kills a pedestrian."

Mr. Forrest says reports from Red China and Russian satellite countries indicate emphasis on auto making is rising. Even so, only a tiny part of the need is being met. "It's unlikely their vast potential will materialize to any appreciable extent in the next few years," he predicts, "unless these communist areas turn soon toward giant programs of highway construction and vehicle manufacture."

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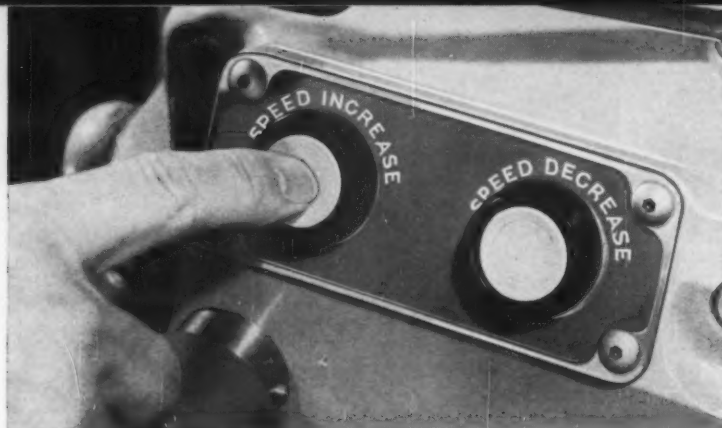
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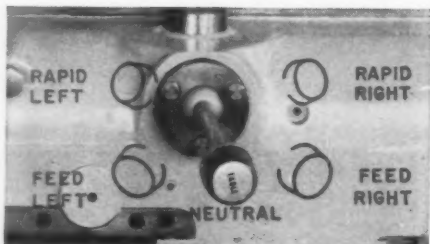
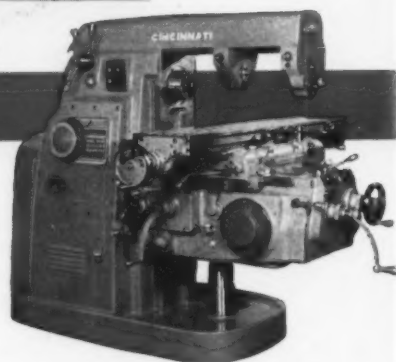
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Labor Plots Revenge at Polls

Labor leaders are readying the attack to topple Congressmen they consider unfriendly toward unions.

Although some want to hold off the attack, the zealots say now is the time to fight back.
—By G. H. Baker.

■ Labor union chiefs plan to widen their political activity in 1960. Irrked over what they consider rough treatment by this year's session of the Congress, they're budgeting both forceful persuasion and hard dollars in a determined drive to topple unfriendly members of the Senate and the House.

It's an uphill fight, however. Some labor leaders privately counsel a "mark time" policy until public opinion begins to swing their way.

Tough School—But zealots of the Reuther-Carey school hotly denounce such tactics as "defeatist." They insist upon notching up their program of selling unions to workers and the public.

The present Congress is far from being an anti-labor Congress. The labor reform bill enacted by top-heavy majorities should not be construed as punitive legislation. It is simply a moderate reform measure. And is designed to curb some of the more outrageous forms of pressure tactics that came to light in hearings before the Senate anti-rackets committee in the past two years.

Having written some temperate curbs into law, the labor attitude of the Congress now is one of sitting back to observe the workings of the new law.

Unofficial Rule—It would be a

mistake to conclude that further union-regulating laws are in store for 1960. After all, 12 long years passed after the enactment of the Taft-Hartley law (1947) before any revision was undertaken. Prior to Taft-Hartley, the nation's employers and employees were governed for 12 years by the Wagner Act.

Business Mailing Costs May Climb

Business mailing costs will go up again next year, if the Post Office Department has its way.

Postal officials are set to press for another boost in first class mail

rates in 1960. Congress turned down an Eisenhower Administration request for a one-cent boost this year. Postal officials now indicate they may ask an even steeper boost.

The Post Office wants the new rates to help reduce an annual deficit now running at some \$650 million a year. A one-cent boost in the first class rate would recover about half of that—a two-cent boost almost all of it—postal officials say.

In the past, the Post Office has usually sought boosts in air mail and other categories as well as in first class when hikes were proposed.

Labor Has a Big Shopping List

What does labor want of Congress? Here's the official shopping list. Note that no cost estimates are provided. Also, it would appear that no thought has been given as from where the money to pay for these programs will come.

Raise the national minimum wage to at least \$1.25 per hour, and bring under federal control all employees not now covered.

Give money to depressed areas.

Use federal money to build more schools.

Set federal standards for unemployment compensation.

Offer government health insurance to the aged.

Build more government housing, including homes for those in the middle income brackets.

Develop more public works projects, including "vigorous" development by the government of atomic projects.

Close tax loopholes, and end excise taxes.

Compel the Federal Reserve Board to pursue a greater rate of economic growth for the nation.

Bar non-union contractors from federal procurement.

Enact a "meaningful" civil rights law.

Admit more refugees from abroad.

Give more aid to farmers.

The AFL-CIO warns that it intends to punish politicians who oppose the above.

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West Gets More Ordnance Work

Area Gets Half Billion in New Orders for 1960

Farwest's skill in rocket and missile making helps land Army ordnance contracts.

Southern California's share of ordnance budget keeps expanding.—By R. R. Kay.

■ Nearly \$½ billion in new Army ordnance orders will go to firms on the West Coast during 1960.

Metalworking will get the major share. Bulk of the business will again go to Southern California—\$400 million worth.

Plus Backlogs—The half billion dollars is on top of the Farwest's present \$1.8 billion backlog in ordnance contracts. That area is an important market for firms across the nation who serve ordnance contractors with materials, equipment, and services.

The Southern California share of the ordnance budget increases year by year. This year it's \$376 million; last year, \$235 million.

Why Growth?—The growth picture is logical. The area is a vital missileworking center. And the Army contracts are for missile projects such as Nike Hercules, Hawk, Nike Zeus, Corporal, Sergeant, Redstone, Jupiter, and several rocket jobs.

What will happen to Farwestern ordnance business now that the Air Force is getting the prime spot in space work? Most experts say, "Nothing." At least, not yet.

Broad Range—The area's economy gets healthier every year through diversification. What may be lost in Army missile work could be made up in a broad range of other products for the Army. Some

of today's contracts are for bearings and brake tubes, semi-trailers, automotive shackles and springs, tank sights, and encased seals.

Boeing's Plans

As expected, Boeing Airplane Co., Seattle, will get a major part of the Dyna-Soar project.

The multi-million-dollar contract, shared with Martin Co., Baltimore, makes the Seattle firm's outlook healthy. And it puts the company in a strong spot in space age activities.

The \$53 million Air Force con-

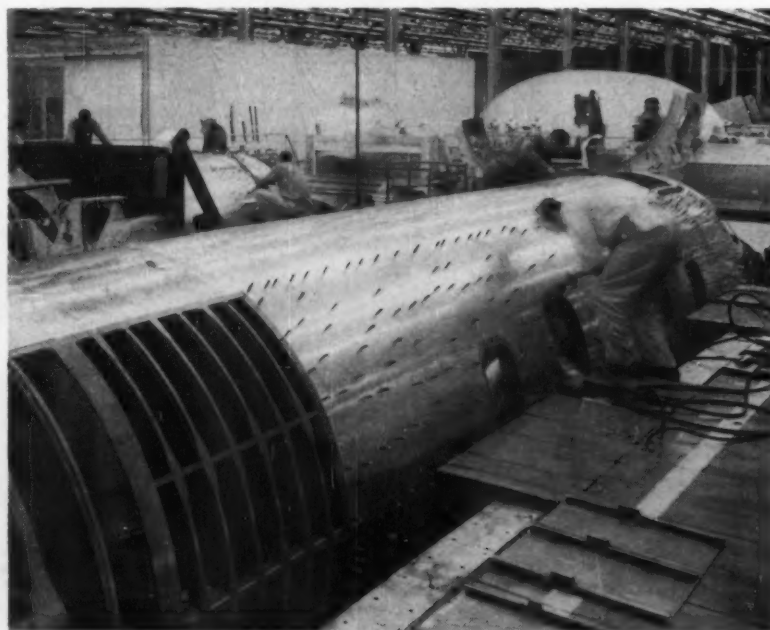
tract is for development work during fiscal 1960. Boeing will build, assemble, and test the vehicle—and integrate subsystems and boosters. Martin's end of the work is the booster.

Target date for the first flight: 1962.

Seattle's Progress

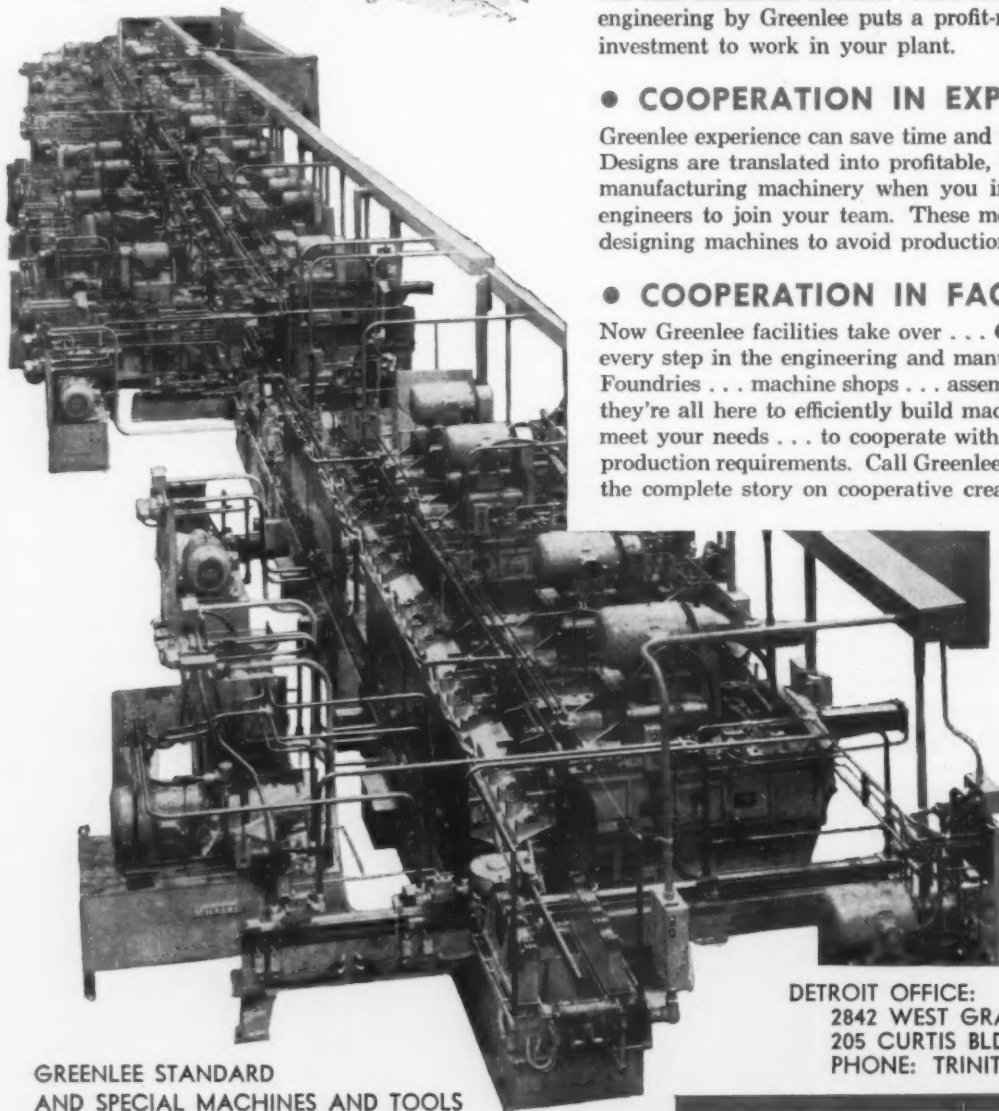
Seattle's industrial development keeps rolling along at a good pace. A \$10-million waterfront modernization plan is under way. The city hopes to attract new business for the whole Puget Sound area.

JetStar Has Short Trip to Test Station



ASSEMBLY, THEN TEST: After JetStar fuselages are assembled at Lockheed plant they move by overhead crane to pressure chamber in background. Despite nearness to assembly area, chamber is safe location for dual rain and pressure testing under hazardous conditions.

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- Hydraulic Tools for Electricians, Plumbers, Contractors

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Greenlee engineers work with your men at all levels of management, production, and engineering. They gather and exchange information based on broad experience. These contacts accelerate creative thinking . . . one idea stimulates another. Thus cooperative creative-engineering by Greenlee puts a profit-making investment to work in your plant.

• COOPERATION IN EXPERIENCE

Greenlee experience can save time and money in your plant. Designs are translated into profitable, low-cost manufacturing machinery when you invite Greenlee engineers to join your team. These men know the art of designing machines to avoid production problems.

• COOPERATION IN FACILITIES

Now Greenlee facilities take over . . . Greenlee controls every step in the engineering and manufacture of machines. Foundries . . . machine shops . . . assembly floors . . . they're all here to efficiently build machines to meet your needs . . . to cooperate with you in meeting production requirements. Call Greenlee . . . let them give you the complete story on cooperative creative-engineering.



*Miss Jones:
write for available
literature and mail
this to Joe Thompson
C.F.*

DETROIT OFFICE:
2842 WEST GRAND BLVD.
205 CURTIS BLDG.
PHONE: TRINITY 2-3938

Machines designed with the future in mind

GREENLEE

BROS. & CO.

1747 MASON AVE.

ROCKFORD, ILLINOIS

*Joe: These people have a lot of machines in the Detroit area -
look them over and let me know your reaction. C.F.*

Why Tool Builders Look Abroad

They Have To, to Compete in Foreign Markets

Lower wages for skilled labor virtually force U. S. machine tool builders to operate abroad.

Foreign operations are the big topic at NMTBA meeting. New officers named.—By R. H. Eshelman.

■ Look for more machine tool builders to set up plants and manufacturing affiliations abroad. That's the big news from the National Machine Tool Builder's Association meeting at Greenbriar.

Virtually all talks and discussions in general sessions touched on some aspect with this vital topic. Lone exception was a speech on labor problems—and that's closely allied with the flight of American industry overseas.

Cost Comparisons—According

to Gustav von Reis, President of Detroit Broach, cost of hiring expert toolmakers in Europe runs about \$1 to \$1.25 an hour; comparable labor cost here is over \$4 an hour with fringe benefits figured in. Mr. Von Reis, who grew up in Europe and makes frequent trips abroad, warns: "Don't discount European engineers. They're as competent and clever as any in the world."

E. H. H. Graf, vice president, sales, of the firm, points out that labor conditions have stabilized in Europe. Workers identify their future with the firm's, take pride in their product. Government and tax policies also contribute to a favorable business climate.

Going Abroad?—At the NMTBA meeting discussion significantly focused on how to manufacture abroad, rather than why. This em-

phasis underscores one fact now accepted almost without question. Makers of machine tools and other products with high labor content are convinced they must seek manufacturing arrangements abroad if they are to compete in world markets—and that includes the U. S.

J. Delano Hitch, Jr., president of Door-Oliver, Inc., Stanford, Conn., compared manufacturing operations in various countries. In case anyone had missed a good bet, a lively panel session detailed how to manufacture abroad. With President Walter Bailey of Warner & Swasey as moderator, top executives of firms with experience abroad pointed to pitfalls and problems as well as advantages of various types of operations. These include: Foreign plant ownership on minority basis; wholly owned subsidiary; licensing agreement.

New Machine Tool Builders Officers



Mattison



Hicks



Trecker



Herkenhoff



Gay

OFFICERS: Elected by National Machine Tool Builders at their meeting at Greenbriar: President—A. C. Mattison, Mattison Machine Co.; 1st vice pres.—E. M. Hicks, Norton Co.; 2nd vice pres.—F. J. Trecker, Kearney & Trecker Corp.; treasurer—G. E. Marx,

G. A. Gray Co.; secretary—G. M. Stickell, Landis Machine Co.; directors—J. F. Herkenhoff, Minster Machine Co., and H. A. Gay, Cincinnati Milling Machine Co.

INDUSTRIAL BRIEFS

More Land — SKF Industries, Inc., Philadelphia, has bought a 12 acre tract at Hawthorne (near Los Angeles), Calif. The land was purchased to anticipate any expansion requirements of the firm's West Coast facilities.

Official Talk — The officers of Inland Steel Co. and Allied Structural Steel Co. are discussing the acquisition by Inland of the business of Allied. Allied operates structural fabricating plants in Hammond, Ind.; Chicago; Clinton, Iowa, and Knoxville, Tenn.

Down South — Rust Engineering Co., Birmingham and Pittsburgh, started construction of a new \$1.6 million melt shop addition to the Huntington, Va., steel plant of Connor Steel Div. of the H. K. Porter Co.

And Out West — Dow Chemical Co. has purchased the capital stock of Sequoia Metalcraft Co., Inc., a magnesium foundry at San Carlos, Calif. The firm employs about 50 people and will operate as a subsidiary of Dow.

Barb Begun — Ingalls Shipbuilding Corp., Birmingham, Ala., laid the keel of the submarine, Barb. It is the first of two nuclear powered subs of the attack type Thresher class, to be built at the company's Pascagoula, Miss., shipyards.

Doubles — Udylyte Research Corp. is doubling its capacity for manufacturing chemicals used in metal finishing. Five new reactor units are being installed in its Detroit research center.

Teamwork — The Structural Steel Div. of The R. C. Mahon Co. and Whitehead & Kales will furnish all the structural steel for the \$100 million Great Lakes Steel Corp. expansion program. Working jointly, the firms will fabricate and erect 15,000 tons of steel for the project.



JUST ELECTED: New officers of the National Tool and Die Assn. were elected at the 14th annual convention of the organization in New York recently. Left to right are: Harold G. Murdock, first vice president (Arrowsmith Tool & Die Corp., Los Angeles); E. W. Barn-

well, treasurer (Apex Corp., Roseville, Mich.); John A. Barth, president (The Barth Corp., Cleveland); John D. Dewhurst, secretary (Arrow Tool Co., Wethersfield, Conn.); and James A. Perdy, second vice president (Atlantic Manufacturing Co., Philadelphia).

Big Order — Mallory - Sharon Metals Corp. has received a one million lb order for the vacuum remelting of special alloy steel for missile use. The order is being processed at the firm's Niles, O., plant.

For Pittsburgh — Firth-Sterling Inc., has begun operation of separate and complete tungsten carbide sintering facilities at its McKeesport, Pa., plant. The facility will serve the Pittsburgh area.

Replacement — Perfect Circle Corp. has announced plans for a new \$3 million piston ring foundry near Rushville, Ind. The new plant will have three times more capacity than the present Rushville foundry it will replace.

Everything — Houdaille Industries, Inc., has acquired Clamore-Buffalo, Inc., manufacturers of automatic screw feeding devices. The purchase covers U. S. and Canadian patents, all manufacturing rights, tooling and present inventory.

Salt Lake Plant — The Trane Co., La Crosse, Wis., is planning to build a \$1 million plant in Salt Lake City to serve Western markets. It should

be in operation within a year. The plant will be basically a sheet metal operation.

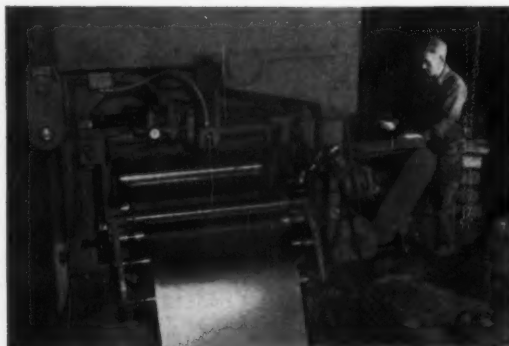
Way Up — A complete line of high strength, tubular alloy steel communications towers, providing structures ranging from 10 to 500 ft in height, is now available from Motorola Communications & Electronics, Inc. All tower components are "hot dip" galvanized steel.

Money Lending — The World Bank made two loans totaling \$44 million to assist in the modernization and expansion programs of two steel companies in Japan. The loans were made to the Japan Development Bank, which will relend the proceeds as follows: \$24 million to Fuji Iron & Steel Co., Ltd., and \$20 million to Yawata Iron & Steel Co., Ltd.

Mill Expansion — Mackintosh-Hemphill Div., E. W. Bliss Co. is expanding its cast steel mill roll capacity. Two annealing furnaces, a mold drying oven, enlarged roll casting pits, and an overhead crane have been added to its steel foundry. Total cost of equipment and changes involved is more than \$1 million.

How to make large stampings more profitably with

AUTOMATIC PRODUCTION



Minster Progress-O-Matic handles extremely wide coil (up to 30" width on this 150 ton press) you get full value from material, less scrap, greater tooling flexibility, multiple parts production, more profit.



Photos courtesy of Inland Steel Container Company, Division Inland Steel Company, Jersey City, New Jersey

Minster Progress-O-Matic Presses

- ... make big progressive die parts automatically at high speeds.
- ... eliminate secondary operations on several presses.
- ... give you more parts per stroke when you double up parts or nest parts on wide material.
- ... have twin-drive gears ... greater capacity above bottom of stroke for draw work and heavy material blanking.
- ... have feed built in uprights close to die, allows close control and support of material.
- ... capacity range 150 to 500 tons.

Talk to your Minster representative about the Progress-O-Matic press or write us for more details.

The Minster Machine Company • Minster, Ohio

MINSTER®



**TOP
RATED**

**for fast, free-cutting...high
production...long wheel life**

SIMONDS WHEELS FOR CENTERLESS GRINDING



"Ground 70,000 pieces compared to 45,000." "Held corners and shape better than wheels previously used." "Entirely satisfactory. Gave excellent finish." These comments from users* are some reasons why Simonds Centerless Wheels are rated superior for job-to-job dependability . . . and good reasons why *your* way to accurate, lower cost centerless grinding may lie in switching to Simonds Wheels. Write for bulletin ESA 55.

*Names on request.

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**Proven products
Dependable know-how
Quick supply**



SIMONDS ABRASIVE COMPANY

**Tacony & Fraley Sts. • Philadelphia 37, Pa.
Division of Simonds Saw and Steel Co.**

BRANCHES: CHICAGO • DETROIT • LOS ANGELES • PHILADELPHIA • PORTLAND, ORE. • SAN FRANCISCO • SHREVEPORT
IN CANADA: SIMONDS CANADA SAW CO., LTD., GRINDING WHEELS DIVISION, BROCKVILLE, ONTARIO

REGULATING WHEEL

Rubber bonded feed wheels exceptionally long wearing and have good traction . . . perfect mate for the Simonds Grinding Wheel.

GRINDING WHEEL

Job-proved Grain and Grade Specifications for all materials. Karvit bushed non-metallic center hole for better mounting and balance.

MEN IN METALWORKING



E. B. Speer, appointed administrative vice president, Central Operations (Steel and Coal), U. S. Steel Corp.

The Cleveland Punch & Shear Works Co.—**C. E. Huddleston**, elected executive vice president.

Borg - Warner Corp., Ingersoll Products Div.—**M. R. McLary**, elected executive vice president and manager.

Illinois Tool Works—**J. R. Russell**, elected vice president and chief financial officer.

Superior Foundry, Inc.—**A. L. Hunt**, appointed executive vice president.

Caine Steel Co.—**Graham Marks**, elected executive vice president; **W. S. Harms**, appointed general manager, Chicago Div.



R. W. Graham, becomes vice president, operations, Steel, U. S. Steel Corp.

J. I. Case Co.—**J. H. Brinker**, elected executive vice president and member of the board.

Royal Industries, Inc.—**J. R. Johnson**, appointed executive vice president.

Crucible Steel Co. of America—**Joseph Scalise, Jr.**, named general supervisor, contract administration; **C. R. Dunlap**, appointed general supervisor, personnel administration, and **G. B. Roberts**, appointed coordinator, management appraisal, Employee Relations Dept., Midland, Pa., works.

ACF Industries, Inc., American Car and Foundry Div.—**E. C. Hall**, appointed director, export sales.

American Chain & Cable Co., Inc., Page Steel & Wire Div.—**R. S. Stonage**, appointed product manager, welding wire and stainless wire.

Wheelabrator Corp.—**F. J. Picard**, appointed asst. director, marketing; **D. A. Swardson**, appointed manager, abrasive and Long-Lyfe parts sales.

American Smelting & Refining Co.—**R. E. Mills**, named Midwestern district sales manager, Continuous Cast Products Dept.



C. F. Borden, appointed executive vice president, Kaiser Steel Corp.



J. D. McCall, appointed president, Columbia-Geneva Steel Div., U. S. Steel Corp., San Francisco, Calif.

Dravo Corp., Engineering Works Div.—**C. R. Boyer**, named manager, Light Metals Dept., Pittsburgh.

The Weatherhead Co., Export Div.—**J. R. Wierdsma**, appointed sales manager.

The Chase Brass & Copper Co.—**C. V. Newman**, promoted to product manager, rod and wire.

Westinghouse Electric Corp.—**R. O. Schlegelmilch**, appointed tech-
(Continued on P. 82)



T. J. Ready, Jr., named executive vice president, Kaiser Aluminum & Chemical Corp.

(Continued from P. 81)

nical director, defense products group.

The Shelby Metal Products Co.—**G. R. Strouse**, appointed asst. sales manager.



P. T. Coffin, appointed general manager, Structural Div., Aluminum Co. of America, Pittsburgh.

Vulcan Containers Inc.—**V. I. McCarthy, Jr.**, named president and director, marketing; **V. I. McCarthy, Sr.**, named chairman of the board.

The Bristol Co.—**L. B. Krumm**, appointed Detroit district manager.

Kropp Forge Co.—**F. E. Mussman**, elected treasurer.

Granite City Steel Co.—**W. W. McMahon**, appointed asst. St. Louis district sales manager.



L. C. Gleason, elected president and general manager, Gleason Works, Rochester, N. Y.



H. F. Carver, elected vice president and asst. general manager, Gleason Works, Rochester, N. Y.

McKinney Mfg. Co.—**R. M. Sprague**, appointed manager, operations, Pittsburgh.

Nalco Chemical Co.—**H. S. Johnson, Jr.**, appointed vice president, marketing; **L. R. Robinson, Jr.**, named manager, Industrial Div.

The Narda Ultrasonics Corp.—**W. H. Venghaus**, named vice president and manager, manufacturing.



P. H. Daley, appointed director, marketing, and manager, export sales, Heppenstall Co. and Midvale-Heppenstall Co.

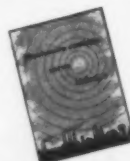
The Electric Autolite Co., Replacement Sales Div.—**E. E. McKeever**, named Eastern regional manager.

Pittsburgh Coke & Chemical Co.—**J. W. Martin**, named project
(Continued on P. 86)



MEEHANITE CASTINGS ARE MADE ONLY BY MEEHANITE FOUNDRIES

The American Laundry Machinery Co., Rochester, N. Y.
Atlas Foundry Co., Detroit, Mich.
Banner Iron Works, St. Louis, Mo.
Barnett Foundry & Machine Co., Irvington, N. J.
Casting Service Corp., LaPorte, Indiana and Bridgman, Michigan
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover, Ohio
Compton Foundry, Compton, Calif.
Continental Gin Co., Birmingham, Ala.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
Dayton Casting Co., Dayton, Ohio
Empire Foundry Co., Tulsa, Okla. and Bonham, Texas
Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machines Co., Inc., Cleveland, Ohio
General Foundry & Mfg. Co., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundries, Inc., Chicago, Ill.
The Hamilton Foundry, Inc., Hamilton, Ohio
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Lincoln Foundry Corp., Los Angeles, Calif.
Nordberg Manufacturing Co., Milwaukee, Wis. and St. Louis, Mo.
Oil City Iron Works, Corsicana, Texas
Palmyra Foundry Co., Inc., Palmyra, N. J.
The Henry Perkins Co., Bridgewater, Mass.
Pohlman Foundry Co., Inc., Buffalo, N. Y.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sonith Foundries of FMC, Indianapolis, Ind.
Standard Foundry Co., Worcester, Mass.
The Stearns-Roger Mfg. Co., Denver, Colo.
Washington Iron Works, Seattle, Wash.
Dorr-Oliver-Long, Ltd., Orillia, Ontario
Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario



WRITE FOR YOUR FREE SINGLE COPY

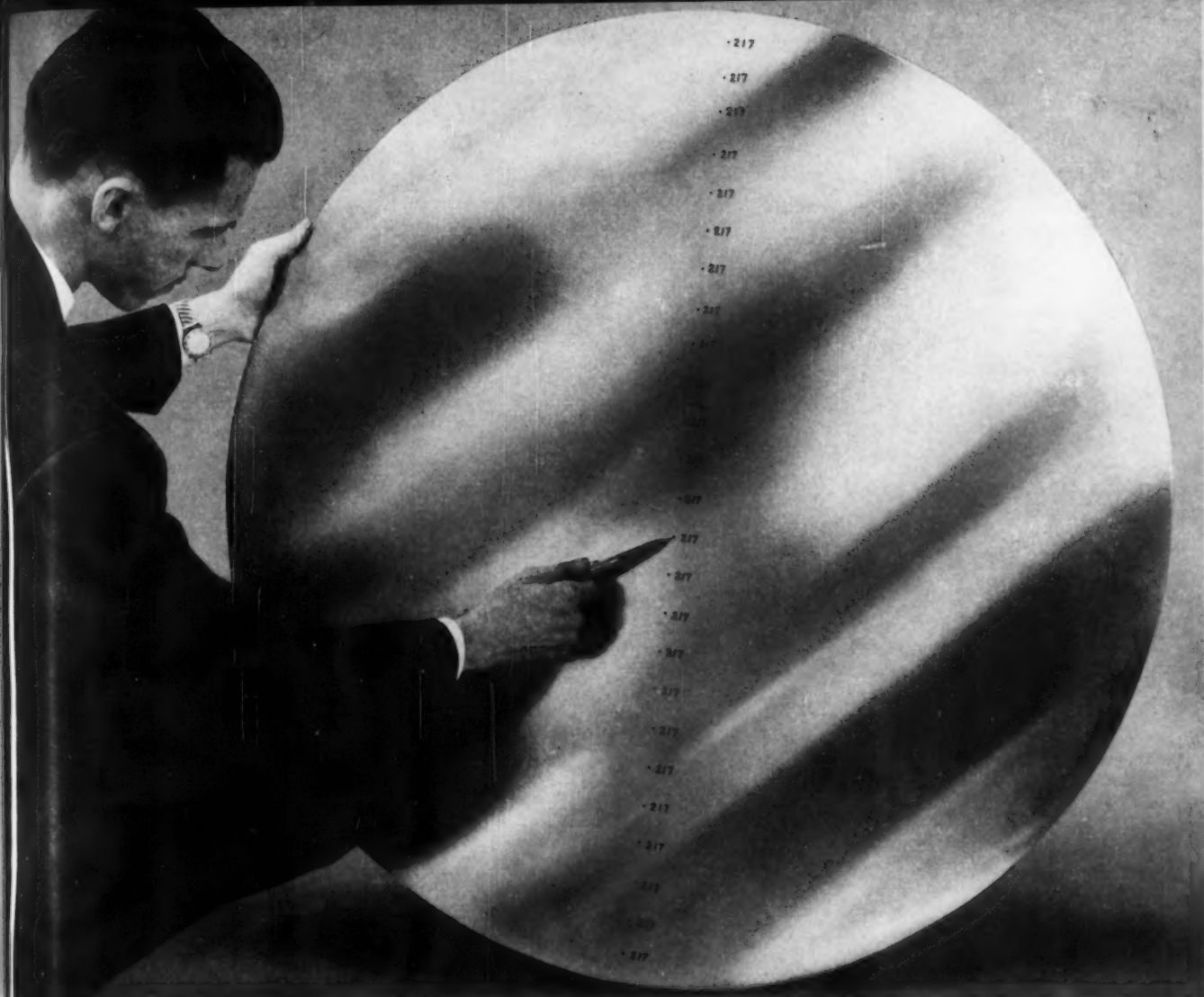
Bulletin No. 35

Meehanite Castings Serve All Industry

Write today to Meehanite Metal Corporation, Department 1A, 714 North Avenue, New Rochelle 23, N. Y.

MEEHANITE®

THE IRON AGE, November 26, 1959



Meehanite castings possess uniform hardness and density regardless of section thickness.

This photograph shows a cross section of a 10' long plate bending roll, which is 38" in diameter and was machined down from 16" to 1½" thickness. It reveals the consistent high hardness of Meehanite metal and illustrates its controlled structural uniformity.

Meehanite metal's dense fine grain structure which assures casting solidity and consistent physical properties regardless of mass or section

is achieved by patented manufacturing methods which relate the carbide stability of the molten metal both before and after processing to the casting section. This unique process results in castings which possess a superior combination of properties that are of prime importance in design and in processing for use at lowest costs.

Meehanite metal represents the most advanced developments in the

metallurgy and manufacture of castings to specified physical properties. There are more than 26 different types of Meehanite available for general engineering, wear resistance, and heat and corrosion resisting applications.

Accept no substitute for Meehanite® quality. Specify Meehanite® and be sure. There is a Meehanite foundry near you. See list on opposite page.

MEEHANITE BRIDGES THE GAP BETWEEN CAST IRON AND STEEL®

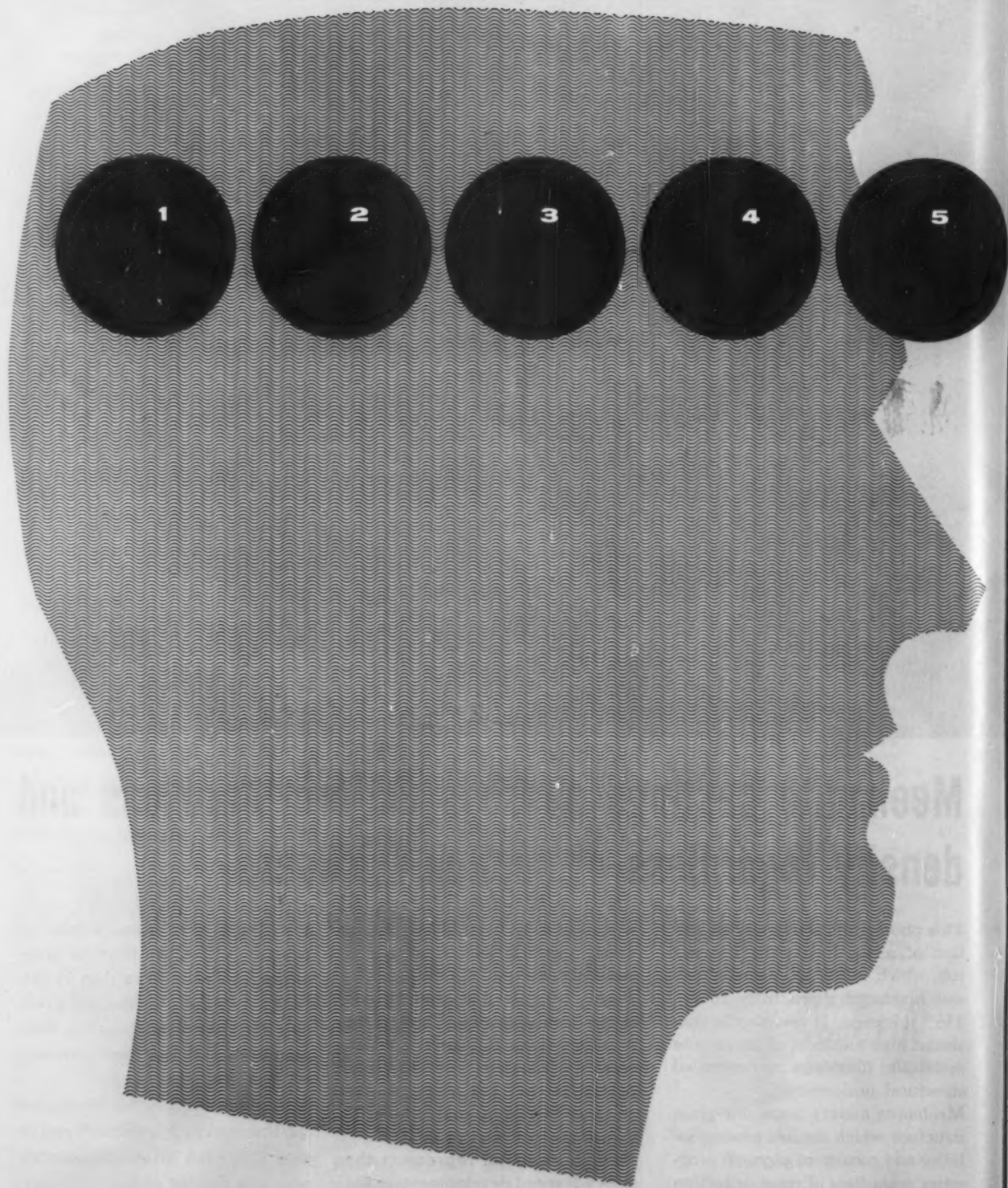
MEEHANITE

MEEHANITE METAL CORPORATION



METAL

NEW ROCHELLE
NEW YORK



WETA

NEW YORK

WETA

NEW YORK

count to ten ...
and then
scream



That shipment of high temperature alloys hits your receiving dock. Everything goes great. No production headaches. No kicks from the field. Your wife looks several years younger and the dog doesn't growl at you any more.

You reorder from the same company. Still no problems . . . except you can't stop smiling while you shave. All told, you get nine separate shipments from this source. You're beginning to think high temperature alloy problems are the fantasies of fools.

So you place order number ten. Same supplier. Same grade. Same everything . . . except *this* lot fails to get by the eagle eye of your inspector. You've got a real procurement problem. Schedules suffer. Now your wife looks twenty years older and the dog snaps at your heels and you would trade your favorite putter for a high temperature alloy you can count on.

Carpenter hasn't come up with a cure for all your woes, but we have perfected a revolutionary new steelmaking process which minimizes variations from lot to lot. Called the MEL-TROL® process, it features a patented mold which reduces segregation of harmful impurities during solidification of the ingot. Result: you get clean, sound, tough metal from surface to centerline . . . in every bar . . . every time you order.

Now predictable performance is yours for the asking.

tool and die steels
stainless steels
***Carpenter* steel**
electronic, magnetic and electrical alloys
high temperature alloys
special-purpose steels
tubing and pipe
fine wire specialties



The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

Faster Load Lifting With New Coffing Quik-Lift Air Hoist



12 MODELS

lift full load 10 feet

500-pound hoist— 7 seconds

1000-pound hoist— 9 seconds

2000-pound hoist—24 seconds

Speed, accurate control, safety and long life are combined in the new Coffing Quik-Lift Air Hoist to give you efficient hoisting power.

Smooth power flow and absolute control at all speeds and loads is provided by the heavy-duty, 8-blade rotary air motor, the air-cooled disc brake and sensitive controls.

This hoist will not drop its load if air pressure fails for the brake is always engaged except when the motor is activated. If air supply fails, load can be safely lowered manually by the brake adjustment screw. The air-cooled, disc-type brake provides four times as much braking area as conventional brakes.

Free movement so that the push-button pendant control is always correctly positioned for easy use is provided by the swiveling features of the air supply hose and pendant hoses. Safety hooks, which are standard equipment on all models, swivel on roller thrust bearings.

The Coffing Quik-Lift Air Hoist is available in 500, 1000 and 2000-pound capacities—with either link or roller chain and with interchangeable manual pull-cord or push-button pendant controls. Ask your distributor or write for Bulletin ADH-79.

COFFING HOIST

DIVISION OF
DUFF-NORTON COMPANY

814 Walter Street • Danville, Illinois

COFFING HOISTS

Ratchet Lever • Air
Hand Chain • Electric



DUFF-NORTON JACKS

Ratchet • Screw
Hydraulic • Worm Gear

(Continued from P. 82)

manager, Commercial Development Dept.



D. G. R. Brigg, appointed general sales manager, forging and die steel sales, Heppenstall Co. and Midvale-Heppenstall Co.



E. W. Fuller, elected executive vice president, Illinois Tool Works.

Borg-Warner Corp., Atkins Saw Div.—**D. B. Matter**, appointed industrial sales representative, Western New York area.

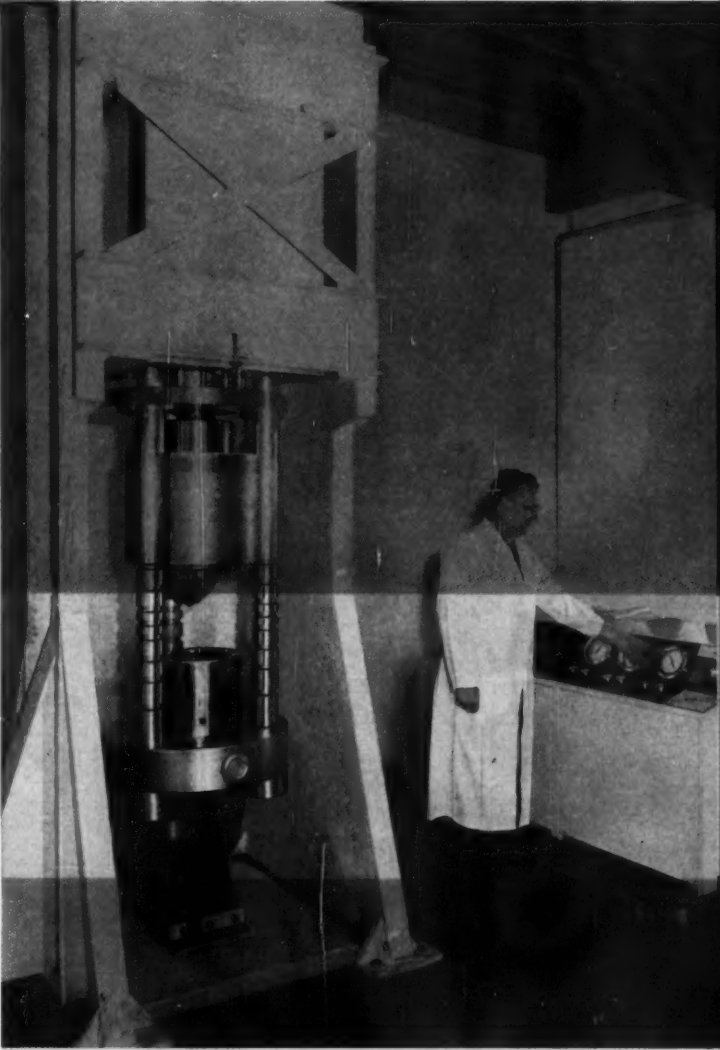
Formsprag Co.—**R. A. Olsen**, appointed project engineer, Warren (Detroit), Mich.

OBITUARIES


W. W. Arpe, 81, former general manager, sales, Laclede Steel Co.

J. L. Hamilton, Jr., Western manager, Mead-Morrison Div., McKiernan-Terry Corp.

A. W. Hanmer, 55, sales manager, Durz Plastics Div., Hooker Chemical Corp.



DYNAPAK Saves Money, Material, Machining, in Manufacture of 19-9 DL Flanges!



19-9 DL Flanges are being produced on this vertically mounted 12-inch Dynapak machine installed in the "white coat" shop of Precision Forge Company, Santa Monica, California

Here are the savings achieved in this Dynapak Application:

- MATERIAL: 60%
- TOOLING: 50% of the cost of conventional forging dies
- MACHINING: Reduced by more than 50% due to forging tolerances of $\frac{1}{32}$ in. and elimination of draft angle.

PLUS

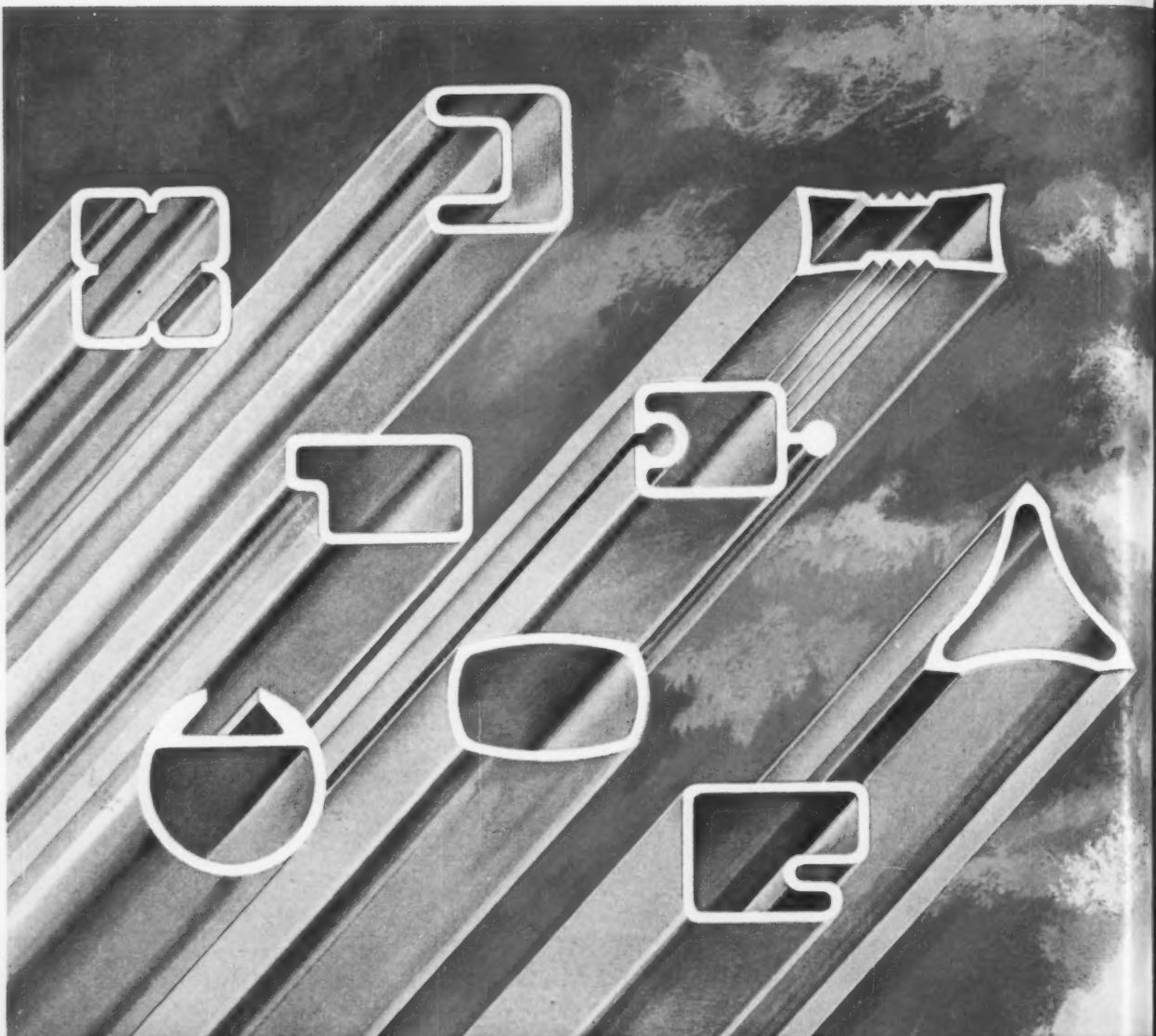
- PRODUCTION RATES: 70-80 per hour
- SUPERIOR PHYSICAL CHARACTERISTICS: Greater strength, uniform and controllable work-hardening, Grain Size No. 11.

Dynapak, industry's first operational high-energy-rate machine tool, offers a breakthrough in metalworking's long-sought goal to produce forgings that can be used with little or no machining. This flange is just one of many forgings now being produced commercially by Dynapak. For complete information regarding application of pneumatically-energized Dynapak in your forging, extrusion, forming, or compaction operations, write, wire, or phone:

DYNAPAK

CONVAIR / A DIVISION OF GENERAL DYNAMICS CORPORATION

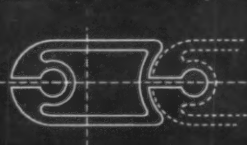
1243 Transit Avenue, Pomona, California • Telephone: NATIONAL 3-1561



UNLIMITED VARIETY OF STRUCTURAL SHAPES—AT LITTLE OR NO EXTRA COST!



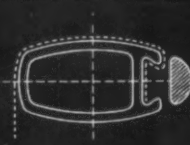
Inlaid (decorative or rubbing) strip



Interlocking features



Modular design concepts



Stitchless (garden chair) covering



Smooth (roll-slide) animation

No longer need you use costly, difficult-to-extrude alloys when you want distinctive styling. New **ALCAN TUBE-ALLOY** gives you the design freedom of structural alloys . . . yet costs no more than alloys that need drawing for required strength.

From Aluminium Limited research—

The first aluminum alloy ever developed expressly for furniture applications

New ALCAN TUBE-ALLOY lets you design tubing to any extrudable shape and design
... eliminates the drawing process and its design limitations

No longer need furniture designs (either functional or decorative) be limited by the drawing process!

For, unlike alloys commonly used for furniture tubing, new ALCAN TUBE-ALLOY needs no drawing to develop required strength. In fact, heat treating alone gives it substantially greater strength than AA-6063 (ALCAN 50S). This means that with ALCAN TUBE-ALLOY you're limited only by extruding—a process that makes possible tubing of most any cross-sectional shape and design.

New ALCAN TUBE-ALLOY also forms readily, gracefully ... without the problem of "orange peel." Normal polishing and buffing give it a superior finish. And—as for cost—it is priced well below higher strength alloys

heretofore necessary when distinctive styling or structural design was required. ALCAN TUBE-ALLOY's cost is competitive with low-strength furniture tubing alloys now in common use.

We will be pleased to send you complete fabricating and metallurgical data on this newest development of Aluminium Limited. Mail the coupon now!

Aluminium Limited



*Serving you . . . through the nation's network
of independent aluminum fabricators*



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630 Fifth Avenue, New York 20.

Gentlemen: Kindly send me
the new technical data
brochure "NEW ALCAN
TUBE-ALLOY."

Name _____
Firm _____
Address _____
City _____ Zone _____ State _____



The Prime Mover Company,
manufacturer of materials
handling equipment, says:

**Our "Prime Movers"
give these 6 parts a
terrific beating...that's
why they're made of
LaSalle**

STRESSPROOF®

STEEL BARS

with copper

Strength



Worm Shaft, 1½"

Without Heat



Input Shaft, 1½"

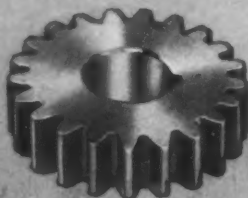
Treating



Driving Axle, 1½"



Shifting Shaft, ¾"



Reverse Pinion, 3"



Bearing Carrier
Clutch Throwout, 2¼"

Engineers of the Prime Mover Company, Muscatine, Iowa, demanded the most dependable steel bars available for six important parts of their transmission assembly. Here are some of the reasons they specified STRESSPROOF!

You don't have to heat treat STRESSPROOF! There's no heat treat distortion.

STRESSPROOF is strong . . . 100,000 psi.

It machines faster . . . at 83% the speed of B1112.

It wears better without case hardening . . . replacing .40 carbon alloy steels and other heat treated and alloy steels, such as 8640, 4140, C1045, C1141, and C1137.

It costs less than heat treated in-the-bar alloys.

Use this coupon to request technical bulletin announcing improvements in LaSalle STRESSPROOF Steel Bars...with copper.

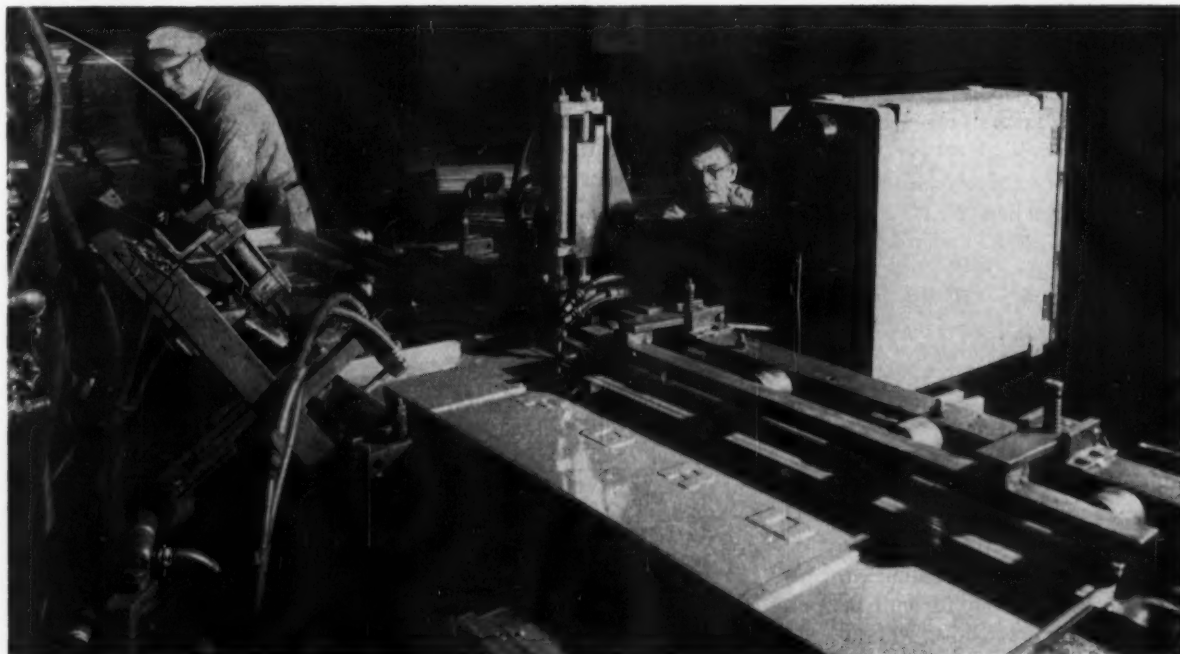
La Salle **STEEL CO.**

1436 150th Street
Hammond, Indiana

Please send technical
bulletin "Today's
Improved LaSalle
STRESSPROOF Steel
Bars...with Copper."



Name _____
Title _____
Company _____
Address _____
City _____ Zone _____ State _____



ELIMINATES ARCING: Old spot welding controls (left) can't stop arcing. New setup runs smoothly.

Feedback Control Commands Reliable Resistance Welds

They kept saying, "How can we use resistance welding when there's no way of telling weld strength?"

With this new control, it's just a problem of the past.

By R. R. Irving—
Associate Editor

■ Certainly one of the great fabrication wonders of the 20th century is resistance welding. There's hardly a metal known today that the process can't join. But it's still not quite perfect.

Take the case of one of the leading auto manufacturers. Even though this company controlled its

failure rate to 0.000017 pct in the spot welding of steering column assemblies, it wasn't low enough. Why? Because this failure rate, low as it seems, was responsible for \$7 million in law suits.

What industry needs then is better spot-welding controls. And The Budd Co., Electronic Controls Section, Philadelphia, believes it has the answer. It has developed an automatic feedback control to produce ideal conditions for spot welding. And it does this in spite of the actual conditions that normally affect weld quality.

Very Useful—Wherever resistance welding is used, this brand-new unit, known as the Monau-tronic V-2, deserves close study.

It can be combined with any existing spot, roll spot or seam welding setup. But the control is not adaptable to stored-energy or capacitor-discharge units.

The complete package consists of a control and firing unit. The control unit is only 30 in. high, 12 in. wide and 25½ in. deep. Its weight is 200 lb. Inside this unit are three vertically-mounted drawers.

Module Functions—The top drawer is a sequence module. Included here is digital pulse-type circuitry. This sequencing is 100 pct accurate, exceeding NEMA's standard spec 3B.

The middle drawer consists of a heat control module. This is the

module that processes input data from the weld. It also contains automatic and manual heat controls, plus lockout devices.

The bottom drawer is the important power supply module. It also contains several other safety features.

The firing unit, mounted on the side of the welding machine near the ignitrons, is just under 2 ft in height and weighs 50 lb. This unit is 10 3/16 in. wide and 5 9/16 in. deep.

Prime Feature — A remarkable feature of the control unit is its ability to "lock out" whenever sub-standard welds are made. At this point, the unit will not continue to operate unless the operator resets the "lock-out" control.

Even then, it will continue to lock out after each weld until the condition is corrected. It will not

make more than one weld in a given area. This frequently happens with conventional controls.

This device was not invented overnight. Budd engineers launched into this program in 1943. The largest builder of auto frames in the world, Budd was well versed in resistance welding. In fact, during the depression, The Budd Co. actually built the first all-welded stainless steel airplane, the Pioneer.

Trial and Error—Until now, engineers had to devise a spot-welding pattern before starting production runs. This took time, since it was nothing more than a trial-and-error method of finding the right welding pressure, time, and current to do the job. Tests, tests, and more tests.

The run began as soon as the proper setting was discovered. But no run would be successful unless

all welding variables remained constant. And they seldom did.

Among the more common variables bothering the engineer are contamination between faying surfaces, tip wear, variations in line voltage, and changes in electrode force.

Research and Development—Finding a theory to correct such problems is one thing. But putting this theory to practice is something else. Budd succeeded on both counts.

Its research engineers soon found that they could relate weld temperature to the voltage applied across the weld. By doing this, they could adjust the current to compensate for any changes in resistance. In essence, they could, in turn, maintain a constant voltage.

Given the name of "voltage constraint," this ingenious theory gave birth to the new V-2 control unit.

The Family Car — More resistance welding is done in the auto industry than anywhere else. And with the popularity of the unitized car body, more emphasis is being placed on welding as a fabrication tool.

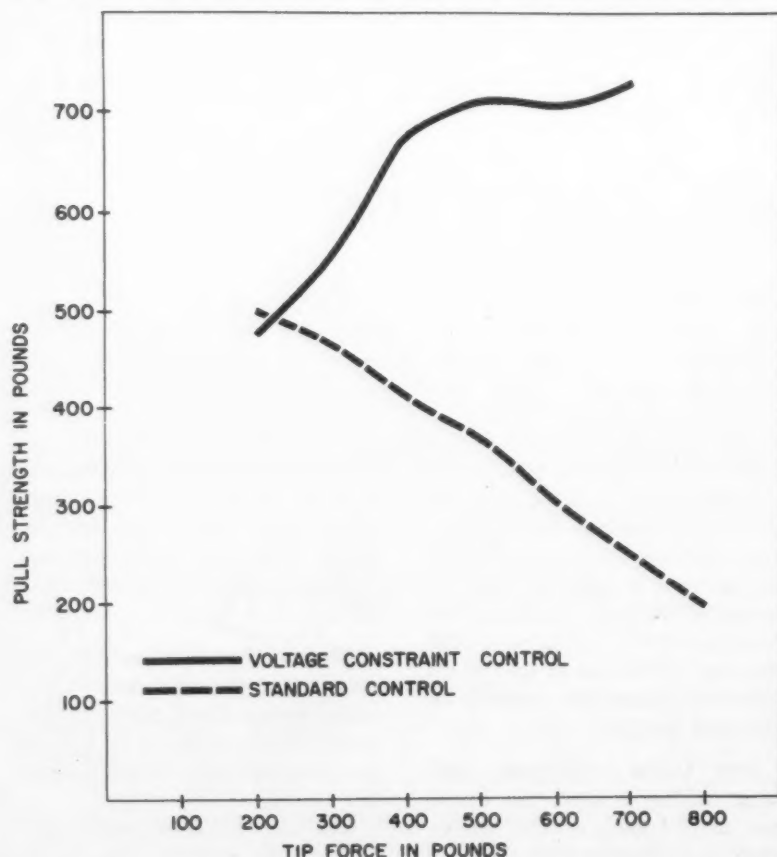
But it's a waste of time to over-weld. The Monautronic welding control can be preset to insure that the exact amount of welds will be made, thus giving the unitized structure its needed strength. Not too many welds, not too few.

In one case, it has meant a saving of about \$30 per assembly. Not only that, each one of them is an acceptable weld.

There are many areas within the automotive industry of potential use. The new control will permit the welding of galvanized metal for rocker panels and other under-body parts.

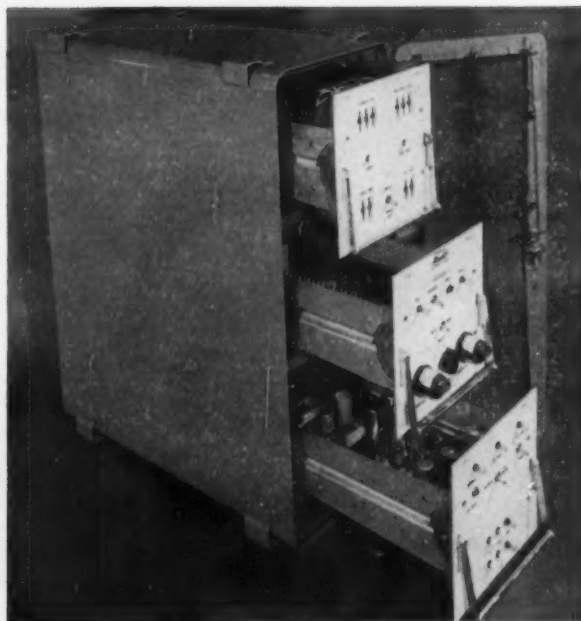
Current Controls—Conventional controls are in use now. And many of them are doing a good job. But with a conventional setup, you don't always get reliable, consistent welds over a long period of time unless you inspect and test at every turn. You can get such results

How Stainless 301 Welds Hold





LEAD ATTACHMENTS: Pickup leads from the control clamp onto upper and lower electrodes.



PULLOUT DRAWERS: Sequence, heat and power supply modules inside drawers can be easily removed.

with the automatic control system.

Many engineers feel quite strongly that the welding industry will benefit from the new control. Through the years, more than a few design engineers have become skeptics of resistance welding.

Their reasons were perhaps justified. They had no way of knowing the strengths of the welds. But chances are these same men have good reason to study resistance welding from a fresh viewpoint.

Better Than Ever—The control will handle any metals previously welded by resistance methods—as well if not better. Also, the system can handle hard-to-weld galvanized iron and vinyl-clad steel.

For some time now, The Budd Co. has used Monautronic equipment on its own production lines with very good results. At present, the control is performing over 20,000 spot welds a day on company lines.

The units are made by Budd's new subsidiary, Budd-Lewyt Electronics, Inc.

A Few More Assists—If your setup is anything but standard, Budd engineers will install custom

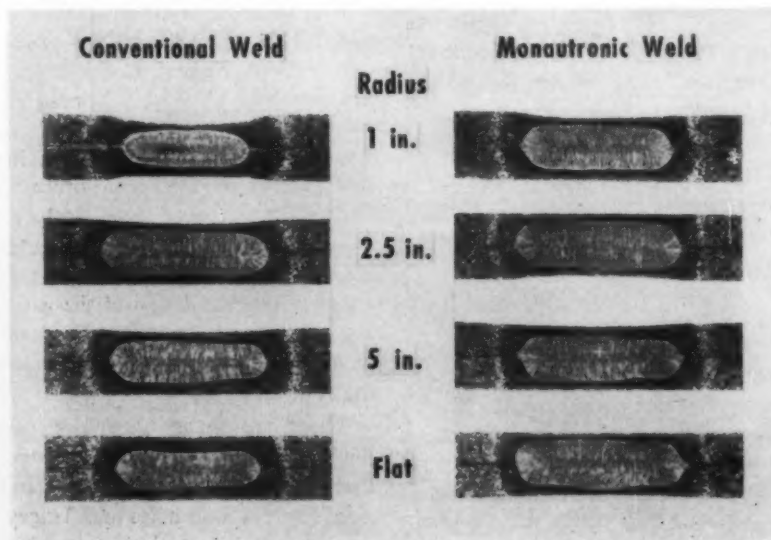
programming to suit your production demands.

They'll also train personnel on how to operate the equipment at their Hunting Park plant. By the way, any technician familiar with welding controls can service and maintain the control system.

The drawers are easily removed. No area is difficult to reach. The

only piece of added equipment might be an oscilloscope. It's suggested to obtain optimum efficiency.

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ELECTRODE SHAPE: Weld nuggets produced by Monautronic controls retain uniformity despite the shape of the electrode.



APPLYING THE ADHESIVE: The adhesive joins diecast butt shoulder joints to flat X-shaped sections.



OVEN CURING: Assembled pumps are placed in a circulating air oven for curing. Temperature is 350°F.

Adhesives Up Diecasting Output

Simplify Designs of Sand-Mold Cast Parts

Are you being plagued by the huge number of rejections in your foundry?

The right adhesive may help you cut many time-consuming corners. And it will bring that rejection rate right down to zero.

■ It's now easy to produce complex hard-to-make castings, thanks to adhesive bonding techniques. And it's economical too. The making of cast sections becomes a simple method.

The use of this new assembly technique in the manufacture of pump castings points up the advantages. One large pump manufacturer reports a reduction in its rejection rates. They've fallen from a previous high of 25 pct down to zero with the new technique.

Adhesive bonding is used to assemble three separate diecastings to

form one complicated pump assembly. A one-part high-strength adhesive with an epoxy resin does the trick.

No More Sand Molds—Known as EC-1386, the adhesive is a product of the Adhesives, Coatings and Sealers Div., Minnesota Mining & Mfg. Co., St. Paul. The old method involved casting the pump part in one piece by the sand-mold process. But the results were unsatisfactory.

For one thing, blow-holes would often occur. This was due to the complex interior design of the casting. As a result, rejection rates ran as high as 25 pct. On a 1000 casting run, that adds up to \$750.

There are many advantages in the adhesive bonding of the three diecast sections. It eliminates any need for lugs, bolt holes and flanges needed for mechanical fastening. Naturally, that does away with costly machining.

Cuts Fringes—And, since the adhesives automatically seal the three diecast sections during bonding, there are no more separate sealing or gasketing operations.

You can cut distortion to a minimum too. Those high heats you get in welding and brazing just aren't around. Since there are no corrosive fluxes needed, you can eliminate costly neutralizing steps.

Adhesives also permit the use of lower cost casting materials. To join sections of castings by welding or brazing, you must use high-temperature resistant alloys. In many instances, this limits the type of usable casting material.

Anybody Can Do It—Unskilled labor can perform these bonding operations. That's something to consider in comparing production costs. The process is easily adaptable to both short and long runs.

The cost per part for adhesive

assembly is not important when you consider the high rejection costs with the other method. One gallon of adhesive will assemble 1000 castings. And the adhesive cost per part is 3.2¢.

The first bonding step involves the sand-blasting of casting surfaces. Next, apply the one-part epoxy resin adhesive by pressure flow gun to one contact surface of the diecast sections.

Important Steps—This will assemble the sections. And, since the epoxy resin has void filling properties, no close tolerance machining of mating surfaces is necessary. Nor is a pre-drying step required. The adhesive is solvent-free.

To be specific, apply the adhesive to the butt shoulder joint of one of the diecast sections. Then assemble the flat X-shaped section in place.

Next, apply the epoxy resin base adhesive to the contact edge of the X-shaped section and the stainless square section. This latter section is a wear plate to resist thrust of the pump rotor blade.

Curing Temperature—The part is then placed in a circulating air oven at 350°F to be cured. The oven can handle up to 25 castings at one time. Assemblies for a one-month's production of pumps can be achieved with this method in about five days.

Curing at higher temperatures spells faster rates of production. For example, the adhesive will cure in 7 to 10 minutes at 400°F and in 1 to 2 minutes at 500°F.

Type EC-1386 compares favorably with other epoxy resin adhesives. It provides higher strength bonds with greater bending strength and greater resistance to cracking or shattering under shock loads.

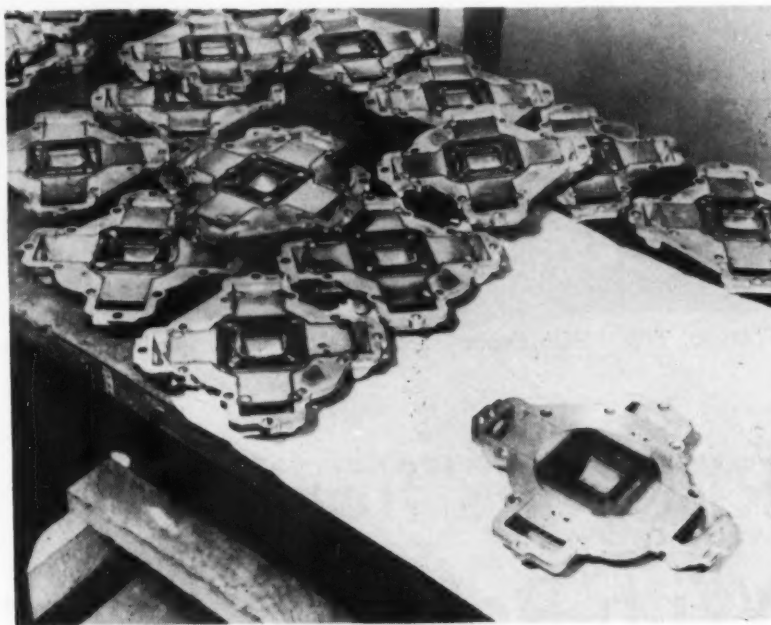
What Are the Strengths?—The adhesive can provide very high shear strengths without adding an accelerator or catalyst. Average over-lap shear strengths are in the range of 4670 psi at room temperature and 4630 psi at 180°F.

This 100 pct nonvolatile, liquid adhesive also provides unlimited working life. And it eliminates the problem sometimes met with two-part epoxy resin adhesives. These include short working life and possible human errors while mixing.

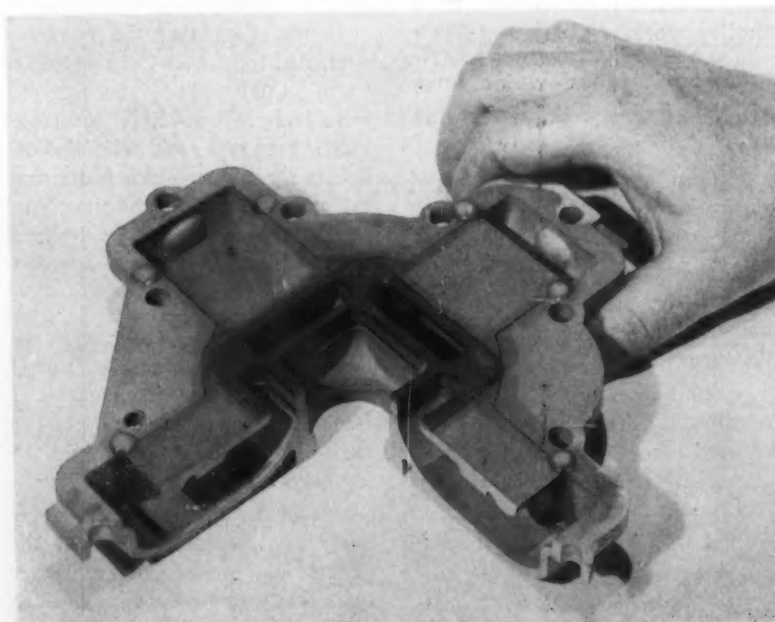
It's designed for metal bonding

wherever service temperatures range between -67° to +250°F. It's useful for bonding impervious surfaces, since no volatile by-products are given off during the curing cycle.

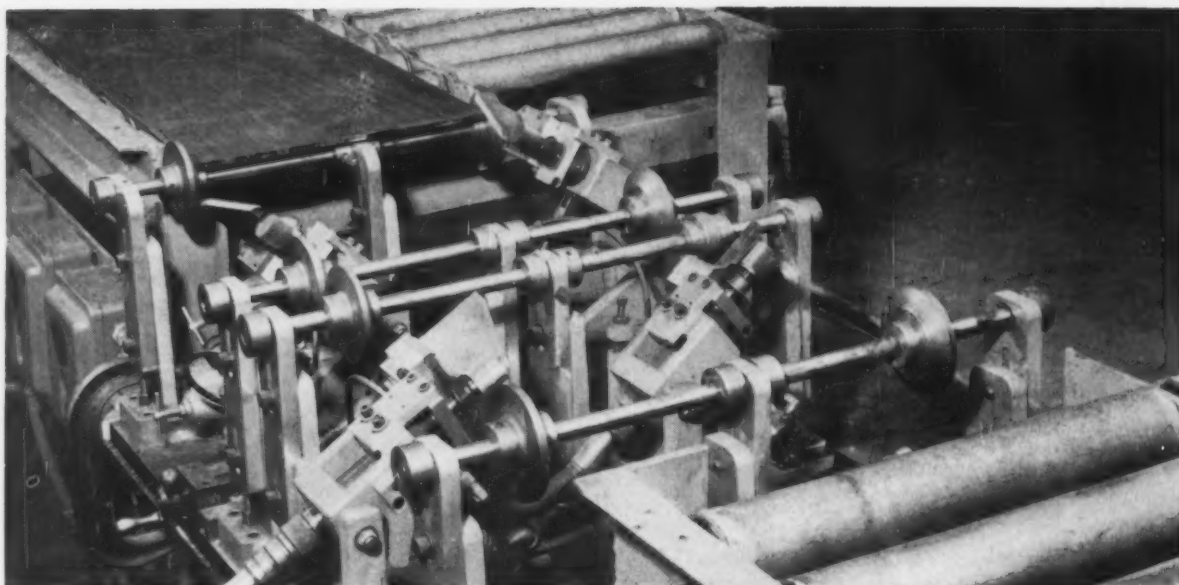
This new bonding method opens up many roads formerly blocked by old-fashioned design logic.



READY FOR MACHINING: After curing, adhesive bonded pump assemblies require machining on the casting's face. The adhesive is machinable.



BONDED SECTIONS: There are three adhesive bonded diecast sections on the inside of each pump assembly. It results in greater strength.



ENTERS THE LINE: Copper sheet travels along the production line on the way to the deburring operation.

Rid Burrs from Sheet Edges With Rotary-File Machine

Man vs. machine: a never-ending battle. Man often does quality work.

But he is too slow for some of the high-speed production lines.

■ Copper mills have their problems too. One of them is getting rid of those sharp burrs that form on the edges of the stock. This is a common headache in the final finishing of copper sheet.

Naturally, before such stock can be shipped, these burrs must be removed. In the past, the only known way to do it was by hand. This time-consuming operation was nothing more than a senseless bottleneck.

To speed up the flow of sheet and bar copper, the production group at American Brass Co., Ansonia, Conn., thought of replac-

ing this slow deburring method with a special machine.

It was then that the company contacted the Jarvis Corp., Middletown, Conn. The specifications were laid right down on the table. First, the new machine had to deburr the copper much faster than the method in use at the time. And second, the unit should be designed to fit into the roller conveyor production line.

In Operation — American Brass now has its machine. As far as speed is concerned, it completes in 30 minutes what it used to take two men eight hours to do. And it's stationed on the production line.

One of the chief problems facing the Jarvis engineers was the dimensional variance of the copper stock that would be passing through the machine.

This meant that they had to design cutters flexible enough in

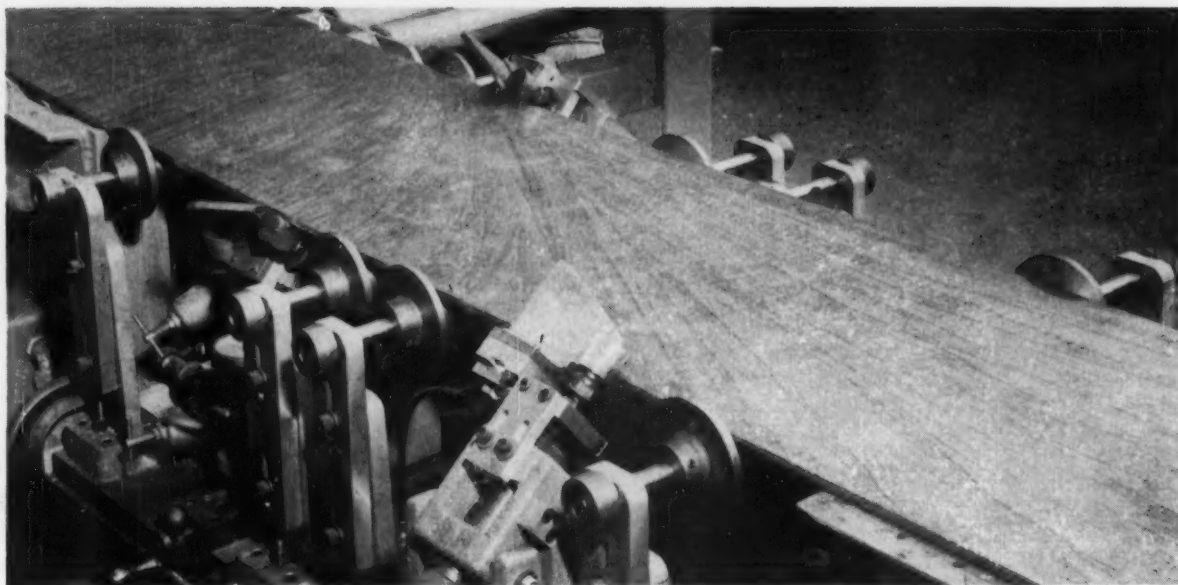
movement to make up for the differences in width, thickness and warp of single schedules of material.

Seasoned Staff — But Jarvis engineers had the know-how to cope with this problem. Their many years' experience in the manufacture of tungsten-carbide rotary files, flexible shafts and multiple spindle drilling heads paid off.

The completed machine basically is quite simple. It makes use of flexible shafts that drive rotary files. And these files automatically adjust themselves to ride the undulating copper.

The machine derives its power for cutter rotation from a $\frac{3}{4}$ -hp electric motor. The latter drives through a gear box to four separate flexible shafts. They, in turn, are connected to four rotary files.

Let the Files Do It—Two of the files are positioned below and the other two above the copper stock.



FOUR-WAY DEBURRING: Simultaneous deburring by all four rotary files results in clean, smooth sheet edges.

As a result, you get simultaneous deburring on all four edges.

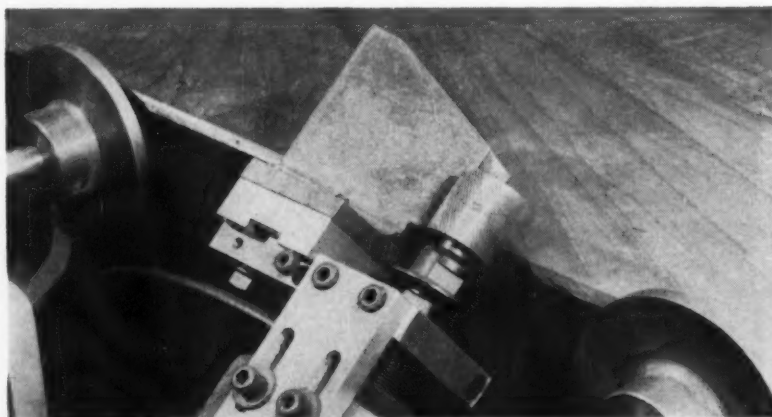
The files, attached to pivotal arms and air valves, move in, out, up or down. And they follow the contour of the sheet being fed into the machine. Regulated air cylinders control the pressure of the files.

An operator feeds the stock through adjustable guides and support rollers. The stock is deburred quickly and accurately.

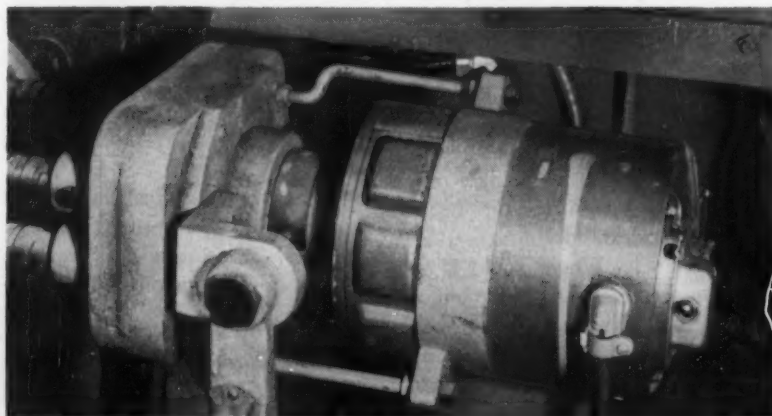
What Rates?—Since the setup at American Brass is new, it's difficult to say how long the cutters will last. But wear to date indicates they'll last indefinitely. Stock removal in the deburring operation is 0.015 in. with a 45° chamfer.

Although, at present, one man is required to push the stock through the machine, the whole process could be completely mechanized. Under automated conditions, the stock would move at 30 fpm.

The new deburring machine is 16 times faster than the old two-man hand method. It all adds up to a pace far more in keeping with normal production requirements. Also, there's no reason why such a machine can't be just as useful with certain other nonferrous metals as well.



RIDES THE WAVES: Pivotal action of rotary file moves up, down, in or out, compensating for variations in stock traveling along the line.



POWERS THE FILES: One single ¾-hp electric motor drives four rotary files by flexible shafts through a gear box for fast deburring.



TRIPLE-DUTY ROLLS: The rolls distribute the metal favorably for the press forging die; they bend the

piece to conform to the press die; and they remove most of the scale formed in the furnace.

Roll Forging Setup Doubles Production of Small Parts

By Herbert Chase—Consultant, Forest Hills, N. Y.

Never close your eyes to new equipment just because it's more expensive than your present setup.

Before you decide, weigh every cost factor. This forging line took the right course.

■ Industries involved in mass production never let up in their quest for better methods to increase output. In this scramble for faster production rates, forging plays an important role. Where could it be more important than in the automotive industry?

One of the forging shops at the Buick Div., General Motors Corp., Flint, Mich., now performs all its major operations in presses. No more hammers.

The reason? Buick officials wanted increased production coupled with greater economy. And it spells success. Most of these parts go into steering and front suspension systems.

There are five 1300-ton and two 1400-ton capacity Ajax presses in the small shop. Each press has its own slot furnace. In addition, an Ajax forging roll passes the heated round bar billets.

This action distributes the metal for favorable flow in the press forging dies. These rolls save work in the press dies, thereby shortening the press cycle.

What It Replaces—Before this new setup came into play, forgings were produced in board drop hammers. This was done without prior roll forming and at rates averaging

less than half those now attained.

The greatly increased production rate more than offsets the increase in labor for a given press, roll and trim line setup. In effect, the faster rate yields a much lower labor charge on a per piece basis.

Where does added labor fit into the new system? There's a new man at the furnace, and another man at the forging press. And the press where hot trimming is done also requires a man.

Points to Consider—With the old setup, trimming was done cold. Even though the speeds were higher, extra handling was needed. And there was a higher average of distortion.

The furnace operator no longer passes the heated billet directly to the hammer man. Now he sends it

into the forging rolls, located between the furnace itself and the forging press. As soon as the billet strikes a trip, immediate passage through the rolls occurs automatically.

The press operator, using hand tongs, then picks up the shaped billet. At this point, he places the workpiece in the first impression of the die in the forging press. There, one blow is usually struck before the operator transfers the part to the finishing impression for a single strike.

Function of Labor—When all blows are completed, the operator lifts the forging and pushes it out, in back of the die. Here, the forging falls onto a conveyor that carries it to the trim press.

At the trim press, a third man in the line loads the forging into the trim die. The punch then pushes the forging through the die and throws the flash into a tote box. Forgings fall onto a conveyor that also drops them into a tote box.

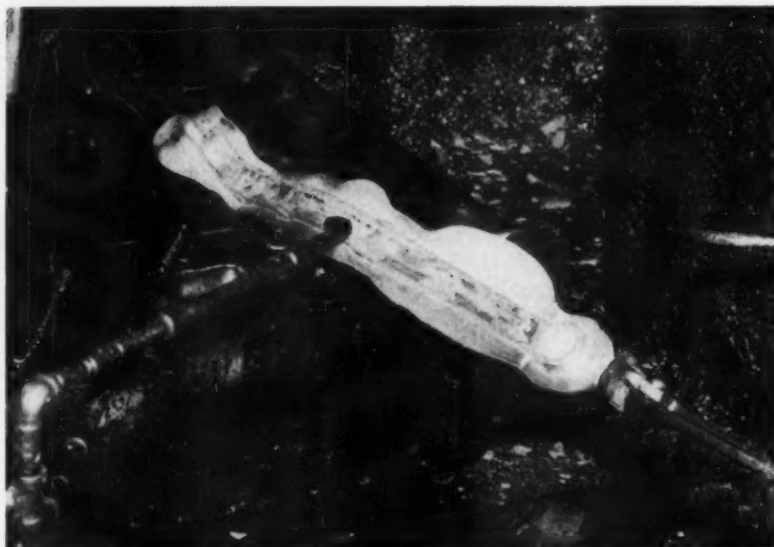
Manual tong handling takes place at three locations: the furnace, the forging die and the trim die. But, in each case, there's a minimum of lifting since hand motions are short.

Temperature Controls—There's a box furnace at the start of each forging line. These furnaces are so equipped to hold constant temperatures. But one of them, a lithium furnace, has atmospheric control. This furnace prevents scale from forming on the billets.

Heating is done in a lower chamber where a highly-reducing atmosphere exists. Final combustion takes place when the combustion products enter an upper chamber. This secondary burning heats the metal floor of the upper chamber. A great deal of heat from this floor radiates to the billets below.

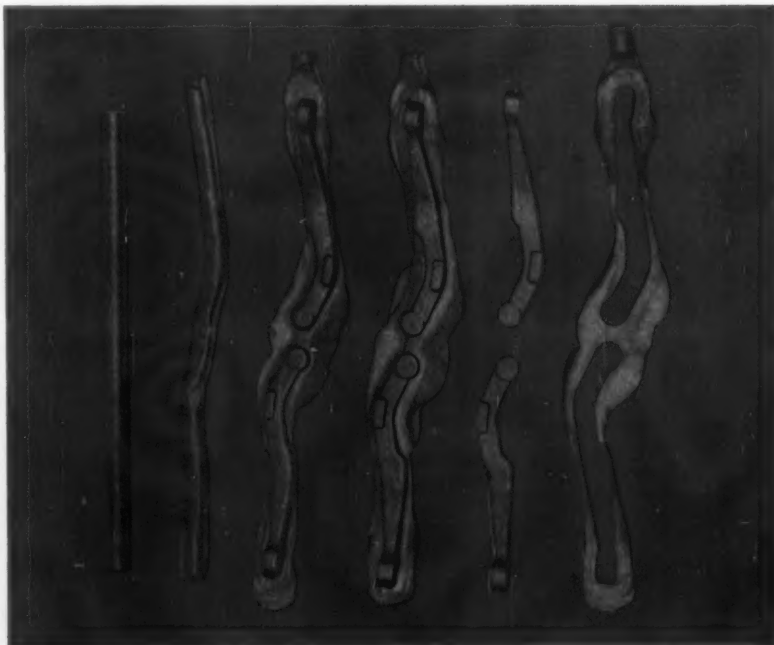
Of course, scale-free billets help increase die life. But Buick engineers haven't quite found out whether the benefits attained justify the more expensive controlled-atmosphere furnace.

Rids Scale—One advantage of



AFTER STRIKING: Lower control arm receives strike in the finishing impression of the press die. Single blow in second impression follows.

Forging in Five Stages



STEP BY STEP: Steering arms are roll formed from round billets to die contours. Press forging, striking and hot trimming are final steps.

using roll dies is that most of the billet scale falls off right on the roll dies. As a result, very little scale enters the press forging dies.

Steering arms are among the parts produced. They are forged

two at a time. These parts receive bends in two planes at right angles. And they also have bosses, facing at right angles. The SAE 1340 fine-grain steel material consists of round bar billets. The dimensions

are 1½ in. diam and 20¾ in. long.

The forging rolls serve a two-fold purpose. First, they distribute the metal favorably for proper flow in the forging die. And second, they bend the bar so that its center-line closely follows that of the press die.

This saves making transverse bends in the press die. It also helps make the roll forging conform more closely to the general shape of the press die.

Steering Parts—In the forging of steering arms, the thermostat is set at 2410°F in the furnace. But the billets have temperatures of about 2350°F when they're withdrawn. Although some cooling occurs in the roll die, the billet retains good forging temperatures for the press die.

The latter die handles 370 double forgings per hour with three men on the line. The former hammer line only used 2½ men. And that included cold trimming.

But hammer dies only produced one-half this output. Even though the old setup could hold the same dimensional limits, as forged, there was more distortion in cold trimming.

Service Life — Hammer forging dies had a life of about 30,000

forgings. Using the new method, press dies last about 25,000 forgings. In time, however, the new setup should equal the life of the hammer dies. In any event, the present method yields a much higher overall economy.

The new setup also forges lower control arms. They form part of the "wishbone" in front suspension systems. Larger than steering arms, only one forging is produced at a time.

Fine-grain hot-rolled killed steel, SAE 1036, is used for this purpose. Billets are 1 3/16 in. diam and 22½ in. long.

A Key Point—The fact that the roll dies only make a slight bend in the 2250°F billet is not the important point. What's really important is that the dies distribute the metal favorably for the next operation.

The three men on this line can turn out about 1760 forgings per 8-hour shift. The billet receives three blows in the first press die impression but only one in the second impression.

Small Parts—Among the smallest forgings made in this shop are idler arms. Once again the billets consist of SAE hot-rolled killed

steel. It's possible to produce these parts three at a time from 1 1/32 in. round bar billets, each 16¾ in. long.

Bosses at the ends of these parts have parallel faces. And the part that joins the bosses has a long one-plane double bend. These parts undergo 2350°F heating in the lithium furnace.

You don't have to bend the bar in the forging rolls. But, as explained before, rolled pieces do contain better metal distribution. As such, you only have to use two triple impressions in the forging press die.

How About Output? — Three men on the line can produce 555 of these forgings per hour. This includes the final hot trimming. Production rate using the former board drop hammer method was 210 forgings per hour. This was the output with 2½ men and included cold trimming.

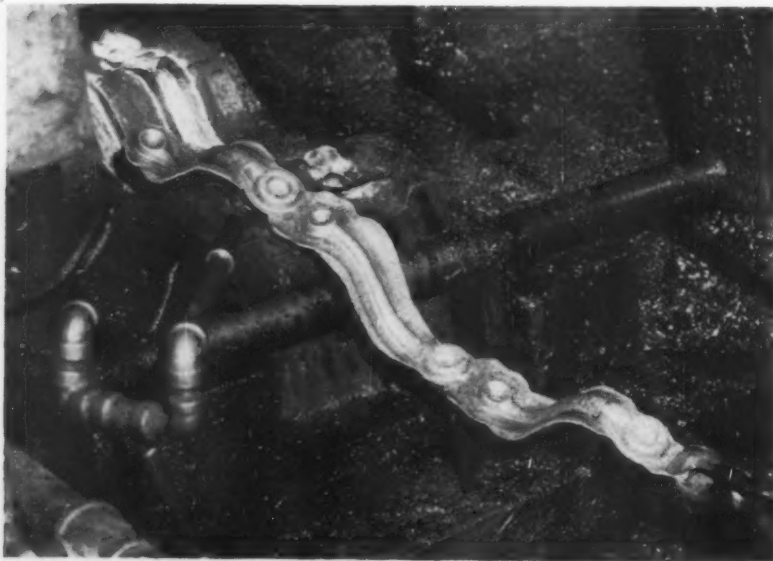
Pitman arms are also forged three at a time from SAE 1340 steel. And these billets are 1 9/32 in. diam and 19 3/16 in. long. These parts are also heated in a lithium furnace.

Here, a three-man team produces 430 forgings per hour, including hot trimming. The hammer method was only good for 200 forgings per hour with 2½ men, trimming cold.

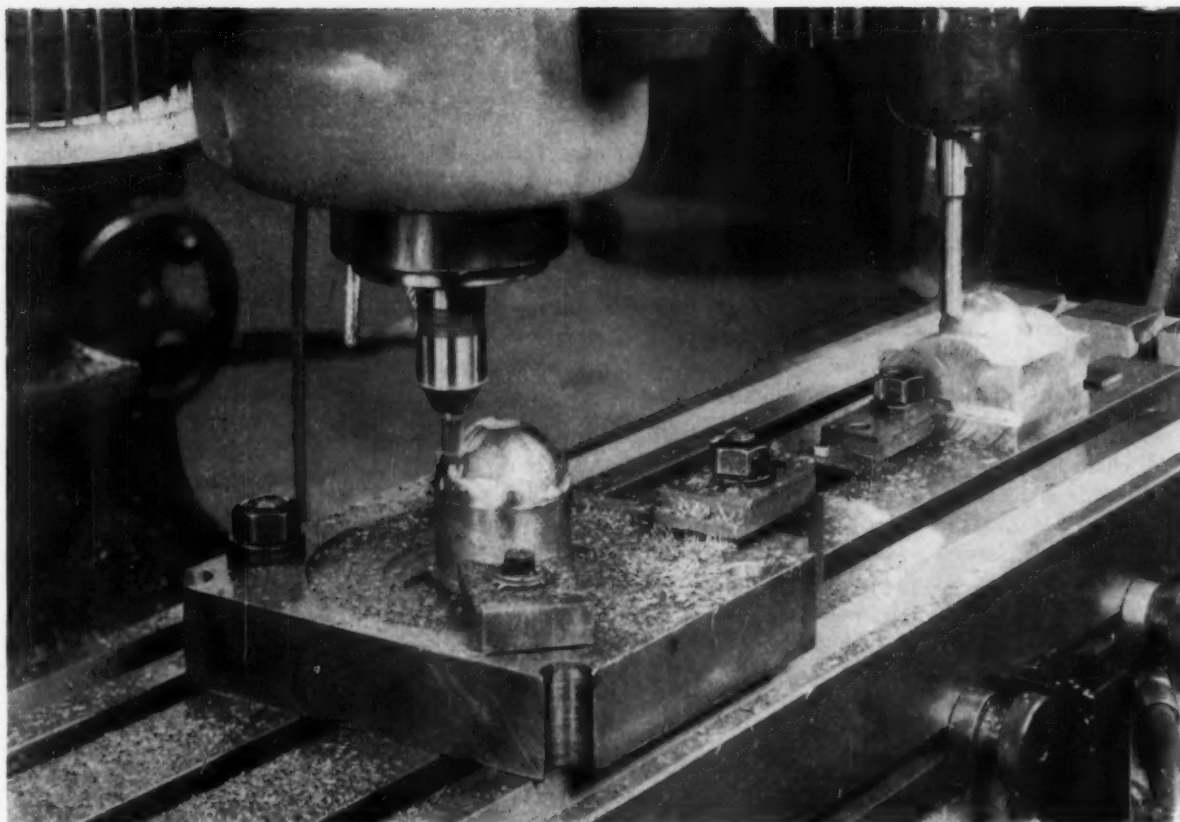
Sum and Substance—It's evident that forging these parts with roll and press dies doubles production rates over the board drop hammer method. Hot trimming reduces distortion, even though it's somewhat slower than cold trimming.

Bear in mind that the new method spells a big decrease in total time per forging. It's also true that forging presses cost much more than hammers.

But forging rolls do not add to direct labor costs. And they certainly help shorten the forging press cycle. In addition, roll-formed billets free scale before they reach the forging dies. So, all things considered, the new setup is well worth the investment.



THREE AT A TIME: Three idler steering arm forgings come out of two-impression press die. They are now ready for hot trimming.



TWINS: End mill exactly duplicates motion of the stylus over the master in fast precision reproduction.

Mill Quality Molds With Tracer

Here's a technique for producing quality complex molds in a hurry.

It's done by milling them under tracer control.

■ On a job of producing a complex multiple-cavity mold, Pacific Mold, Inc., El Monte, Calif., gets a 66-pct reduction in machining manhours and a 30-pct reduction in finishing time.

The same quality finishes are achieved as with laborious and uncertain hand-milling before, and on tough 4140 steel of 24 Rc hardness, to boot. Overall cost savings are 20 pct.

The magic touch is provided by a fully automatic, three-dimensional

Synchro-Trace tracing attachment, made and installed by True-Trace Corp., also of El Monte, on a Gorton Mastermil.

Following a programmed path, the tracer perfectly reproduces a pattern and takes a predetermined cut with each pass. It operates unattended until the part is completed, when it shuts off all power.

Wide Open—For maximum production, the company runs the machine at full speed on both rough and finish cuts wherever possible. On this particular job, cuts up to $\frac{3}{4}$ in. deep at 9 ipm feed are made without any cutter chatter.

The feed is much faster than manual owing to the smooth tracer response and the more uniform feed rate of this hydraulic unit.

Amount of chip load and cutter feed are both adjustable, preventing excessive loads on the cutter. Direction of trace and cutter feed can be selected to provide "cross-hatching," reducing hand-finishing time.

The finish cut is 0.030 in. deep with 0.005-in. feed for a high finish that further cuts bench time.

Ends Troubles—Overcutting and undercutting, even on 90° vertical walls, to which manual milling is prey, are eliminated by the uniform feed, as are uncontrolled plunges or pullouts of the cutter which can damage both cutter and workpiece.

Also, due to stylus sensitivity, it is possible to use soft wooden or plastic masters, eliminating the costly and time-consuming making of patterns from harder materials.

Chain: Pick and Buy It Wisely

By H. F. Reid, Jr.—Manager, Technical Service Div., The McKay Co., Pittsburgh

Are your chain costs too high? Do you have chain troubles?

Knowing how to select and buy it can save money and eliminate problems.

■ All chain for slings is not alike. Though this statement won't surprise you, it's a fact that a lot of people use the wrong chain for the job. By so doing they waste money, or invite trouble, or both.

It pays to know the basic facts about properties and uses of various types of chain, and their relative prices. You will then be in a position to pick the chain for best service at least cost.

For general-purpose use, there are five grades of proof-tested chain, made from four different materials. Each grade has specific working characteristics resulting

from the link pattern and the material used.

The four different materials have different tensile strengths, which need consideration in making a choice for any use.

Safety Rating—The safe working capacity of chain is expressed in terms of "working load limit." This is the maximum recommended load to be applied at any time.

This limit is determined by testing the chain, prior to shipment, under overload—varying from 15 pct higher for wrought-iron chain to double the limit for low-carbon and low-alloy heat-treatable steels.

Wrought Iron—The oldest chain material in use today, wrought iron is one of the two basic types recommended for hazardous overhead lifting operations. Its two outstanding characteristics are high ductility and resistance to salt-water corrosion.

Its minimum guaranteed elongation (the amount it can stretch before breaking) is 15 pct, the same as that of various grades of steel chain. However, experience has often shown elongation up to 35 pct before failure.

It's up to the user to preserve wrought-iron chain's ductility. Used for several years or repeatedly loaded near rated capacity, it will work-harden, and become brittle and crack-sensitive. In this condition, it may fail considerably below rated working load limit.

Embrittled wrought-iron chain can be restored to its original ductility by annealing heat-treatment. This reconditioning is recommended twice a year for chain in heavy, constant service.

(This should be done only for wrought-iron chain. Periodic annealing of other types of chain is a dangerous, unsafe practice.)

Low-Carbon Steel—Chain produced from low-carbon steels is in widest general use. It can be case-hardened for longer service under conditions of extreme abrasion. In addition, hot galvanizing can be used to improve its salt-water corrosion-resistance.

Low-carbon, to the chain industry, means 0.07 to 0.1 pct C. The two grades of proof-tested chain made from low-carbon steel are Proof Coil and BBB Coil.

The difference is link size. A link of Proof Coil is wider and longer. Working load limits for Proof Coil chain are 10 to 15 pct lower than those for BBB Coil of the same size.

Working load limits for both these types are low compared with those of equivalent sizes of alloy chain. Proof Coil and BBB Coil,

Strengths of Chains Vary

MATERIAL	AVERAGE TENSILE STRENGTH, PSI
WROUGHT IRON	48,000
LOW-CARBON STEEL	56,000
HIGH-CARBON STEEL (HEAT TREATED)	85,000
LOW-ALLOY STEEL (HEAT TREATED)	125,000

Use Strength to Cut Costs

Grade of Chain	Size of Chain, Inch	Working Load Limit, Pounds	Typical Retail Price per Foot
PROOF COIL	1	12,400	\$3.40
BBB COIL	$\frac{3}{4}$	12,000	\$3.12
WROUGHT IRON	$\frac{3}{4}$	10,140	\$7.40
HIGH-TEST	$\frac{3}{4}$	11,500	\$2.38
ALLOY	$\frac{3}{4}$	11,250	\$1.92

therefore, are not recommended for hazardous overhead lifting operations.

High-Carbon Steel — High-carbon means 0.17 to 0.25 pct C, to chain manufacturers. High-carbon-steel chains are fully heat-treated and tempered to 85,000-psi tensile strength and 15-pct guaranteed minimum ductility.

Such chains are meeting specific industrial specifications requiring a minimum elongation of even 25 pct before failure.

Unlike wrought iron, these chains do not work-harden in service. Also, their greater strength results in greater resistance to abrasive wear and incidental damage.

Although not recommended for hazardous overhead lifting, they are often used for lifting operations. In such cases, slings are custom-made to requirements, and heat-treated and proof-tested as assemblies.

Low-Alloy, High-Strength—This steel chain is the other basic type recommended for hazardous overhead lifting. It is the strongest chain, size for size, produced for industry. Its high strength and high hardness make it more resistant to abrasion and incidental damage than any other grade of commercial chain.

After heat-treat, its minimum elongation is 15 pct. Greater elongation can be achieved by careful heat-treatment.

Its high strength often permits reductions in the chain size required for a specific application, without reducing overall safety. These chains do not work-harden, and therefore must not be annealed.

Now, what does this all mean regarding chain selection and cost?

Appraising Costs — Chain costs may be appraised in terms of a specific size or a specific capacity. Based on size alone, costs are seen to increase sharply from low-carbon steel to alloy chain.

This approach overlooks changes in chain capacity that accompany

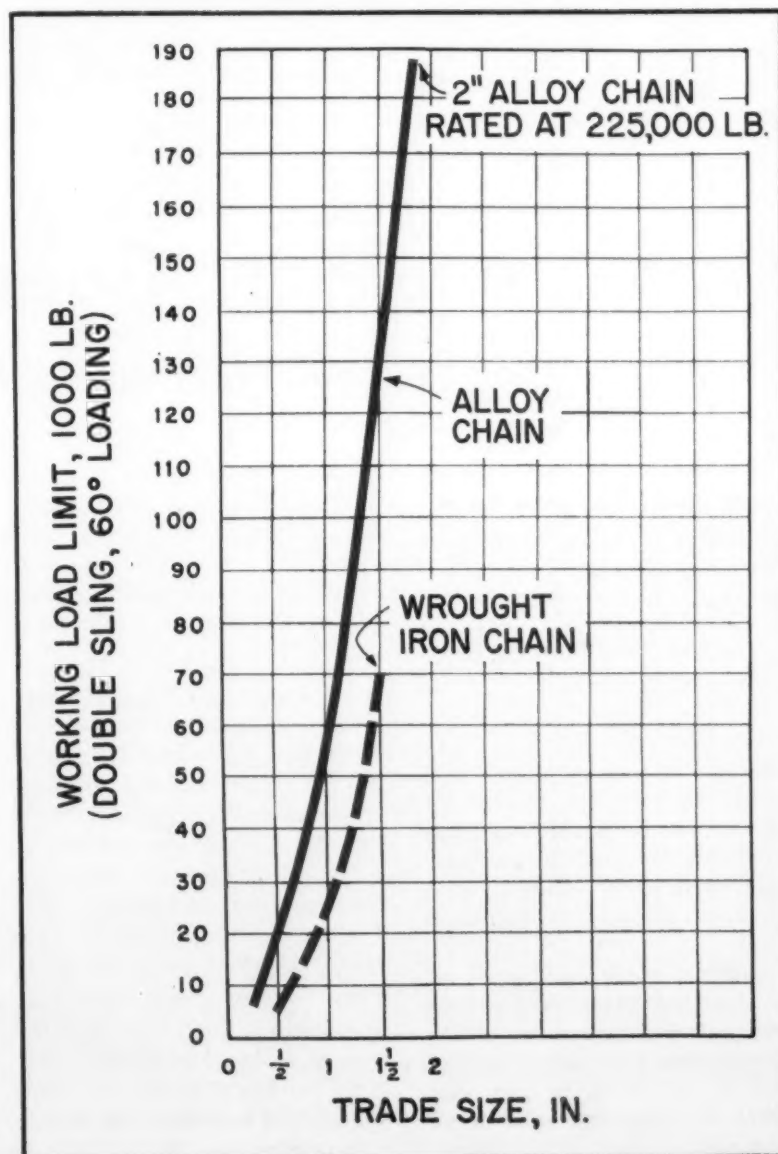
these material changes. A 1-in. BBB Coil chain has a working load limit of 15,000 lb. But 1-in. alloy chain rates at 40,000 lb. In many cases, then, a smaller chain can do the same job at lower cost.

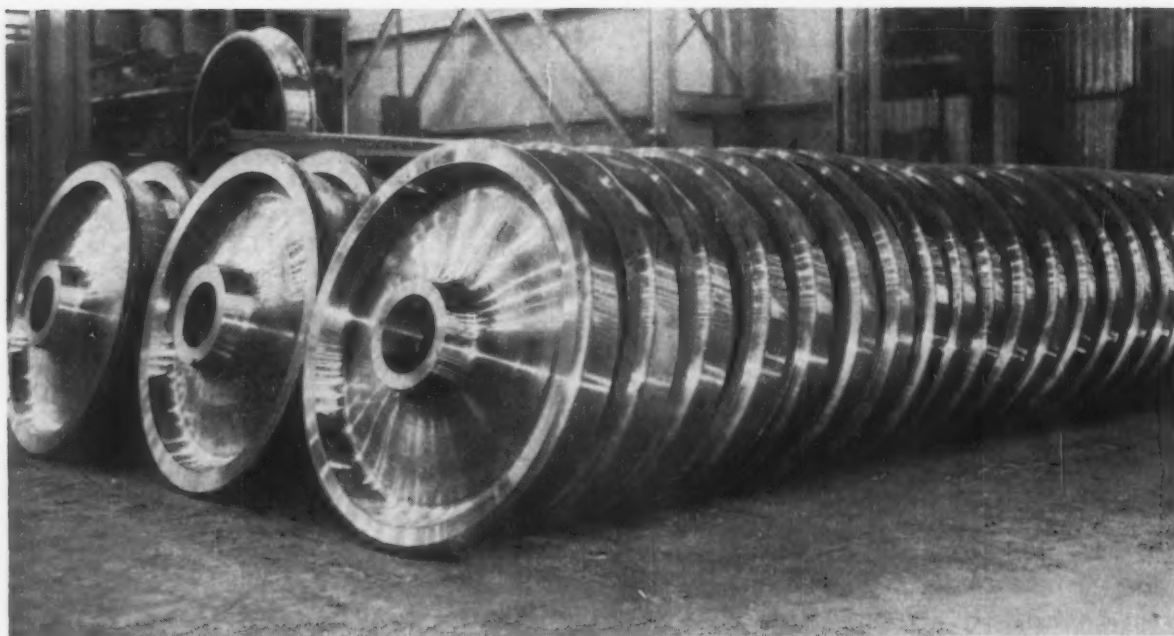
Use Capacity—The more reasonable approach to chain costs is to appraise them on the basis of working load limits. For example, where the 1-in. BBB Coil could be replaced with $\frac{3}{8}$ -in. alloy chain, both size and cost would be reduced without impairing safety.

In terms of potential working capacity, then, the relative cost of various grades of chain shifts sharply. Chain that looks expensive by size is often the cheapest.

In most cases the cost of handling specific loads could be reduced up to 50 pct by using smaller alloy chain instead of wrought-iron chain. Besides cost, other savings result from lighter weight, greater mobility, and greater wear-resistance.

Small-Size Alloy Equals Iron





FINISHED PRODUCTS: Wheels made from wrought steel are vital products in the railroads industry.

New Steel Plant Goes Modern

Uses Automation to Speed Production of Railroad Wheels

Starting a new line? Building a new plant? Then seize the opportunity. Install the very latest in equipment to improve product quality.

See how this Canadian company used its head.

■ Canadian railroads spend about \$10 million annually on steel wheels. In the past, most of the wheels were imported from England. But the emphasis on faster rail speeds has effected some important changes in the overall setup.

Cast-iron wheels could not stand the increased speeds. And a 1958 ruling of the American Association of Railroads required all railway cars to use rolled or cast steel wheels for equipment—new or rebuilt.

Taking advantage of this new trend, English Steel Corp., Sheffield, England, and Canadian Steel Foundries, Montreal, formed a new company in Canada for the express purpose of making cast steel wheels.

The Very Latest — The new plant, known as Canadian Steel Wheel Ltd., is located in Montreal. Automation is playing a big role in this \$12 million operation. Workers operate the latest in machinery, including the only ingot-breaker in Canada, from glass-enclosed, air-conditioned control booths.

According to Gordon L. McMillin, president of the new company, electrical wiring within the plant totals 133 miles. Nearly 2000 tons of structural steel were used in the building structure. The 158,732 sq ft of floor space sits on the 23-acre plant site.

Hydraulic steam and air piping totals 10 miles. The building cost \$2½ million. And there is \$9½ million worth of equipment inside it. At full capacity, the plant employs 175 people.

Into the Melt—The first stop for steel scrap in the production cycle is the melting shop. Equipment in this shop includes two 16-ft diam electric arc melting furnaces. Power for each furnace is supplied by a 17,500-kva capacity transformer, reportedly the largest ever installed on this size of furnace.

A magnet loads the scrap into a 40-ton capacity charging bucket, taking the scrap out of storage and into the melting shop. The scrap rides in a rail car, complete with electronic scales.

Molten metal is poured into a 50-ton ladle and transferred by a 75-ton overhead crane to an ingot-

pouring car. This car traverses the ladle over molds set in a pit. The metal is then teemed down center runners—up into clusters of five or six molds.

Metal Checks — Ingots vary in weight from one to three tons. The analysis of each one follows careful controls to meet the strict specs of the railway companies.

A mechanical-reciprocating machine, driven by a 100-hp motor, breaks each ingot into three or four blocks. This ingot-breaking unit is one of only three such machines in the world.

The blocks correspond in weight to the type of wheel. From the ingot-breaking shop, conveyors transfer the blocks either to storage or to the rotary hearth furnace.

Fast Production — The forging and rolling shop can produce an average of 60 wrought steel wheels per hour. Permanent records keep track of the product throughout each stage of manufacture.

Only seven operators are required to run the entire forging and rolling operation. In fact, these runs are so fast that it's possible to complete the whole cycle in a single heating of the block without reheating.

A 60-ft diam rotary hearth furnace heats the blocks to a forging temperature. The furnace can handle up to 40 tons of blocks per hour. Blocks travel through six heating zones on the rotating hearth until they reach the final zone. Here the blocks are soaked to forging temperatures.

Know Where They Are—An indicator dial shows the number of blocks in the furnace and the exact location of each one. The dial can account for as many as 348 at one time.

Automatic charging and discharging machines move blocks in and out of the furnace. Also, the loading pattern of the hearth can be controlled to permit tests to be

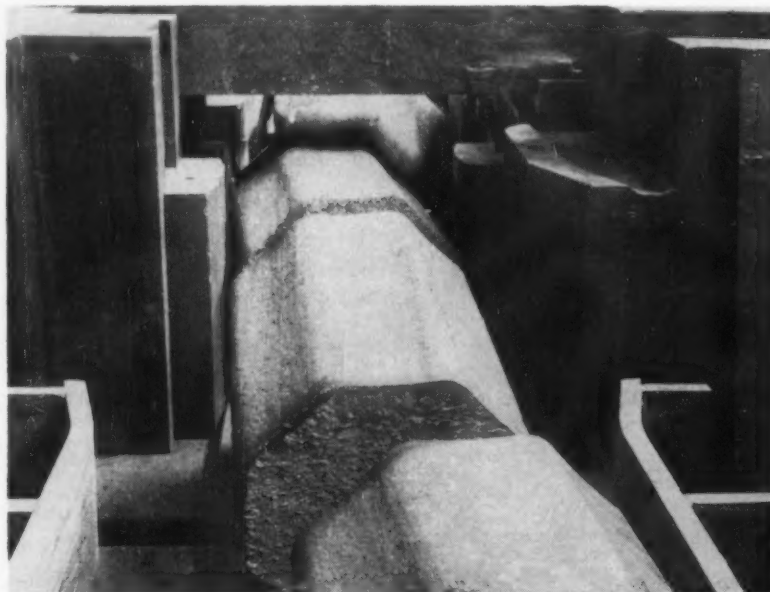
carried out with various heating cycles.

The discharging machine swings the blocks from the furnace in a 90° arc, passing them through a hydraulic descaler. They're then set down on the lower slabbing die of the 6000-ton forging press.

New Shapes — At this point,

slabbing tools reduce the block to a flat disk. Then sliding tables transfer the part to the forming dies. These dies form the hub and part of the web of the wheel. They also displace metal to the rim which permits the rolling mill to finish the wheel.

Roller tables automatically remove the forged blank from the



BREAKING THE INGOTS: Powerful ingot-breaker snaps 17-in. diam ingots into shorter wheel sections that correspond to intended wheel weights.



COMPLETES THE PICTURE: Closed-circuit television enables operator to watch the back of the furnaces from glass-enclosed control booth.

press and transfer it to a 1000-ton punch press. Here, the blank is clamped while a hole is punched to the required size.

After punching, roller tables move the blank to a loading device which puts the blank into the mill.

Gives Profile—A horizontal-type wheel rolling mill forms the finished profile of the rim of the wheel. In doing so, it spins metal from the rim into the plate, permitting the wheel to grow to the intended size.

This mill has two edging rolls and one back roll, each driven by separate electric motors. There are also two pressure and two guide rolls, mounted in separate sliding carriages. Rolling of taper webs relies on electronics.

Then a machine removes the wheel from the mill and deposits it on the lower die of the 3000-ton coning press. This press displaces the hub axially. It also cones the plate, giving the wheel its finished profile.

Label It—A sliding table transfers the completed wheel from under the press to a transfer device. The latter turns the wheel over and raises it to an elevated conveyor.

This conveyor carries it through a stamping press where identification markings are stamped on the rim. Wheel gaging in an inspection unit follows. All these setups are controlled from consoles located inside control booths.

Next, wheels are transferred by roller conveyor to the heat treatment furnaces. Overhead cranes then load them onto cars destined for the first furnace.

Modern Designs—Light fuel oil is used to fire the three car-type heat-treatment furnaces, each nearly 90 ft long. Mechanical cycling of the furnace is fully automatic. Three separate cycles can be determined through push-button controls.

An operator controls the cycle

from another glass-enclosed booth in front of the furnace. And a closed-circuit television unit enables the operator to keep an eye on the back of the furnaces.

Heavily-loaded wheels are hardened on the treads by water quenching. To do this, jets project water onto the wheel rims to obtain the desired hardness.

Tempered Wheels—Final tempering takes place in a third furnace. One-wear wheels, which form the bulk of the output, receive a stress-relieving heat treatment.

Loaded cars leave the treatment furnaces and head for a shot-blasting unit. There, wheels are unloaded from the car and loaded onto an overhead cooling conveyor.

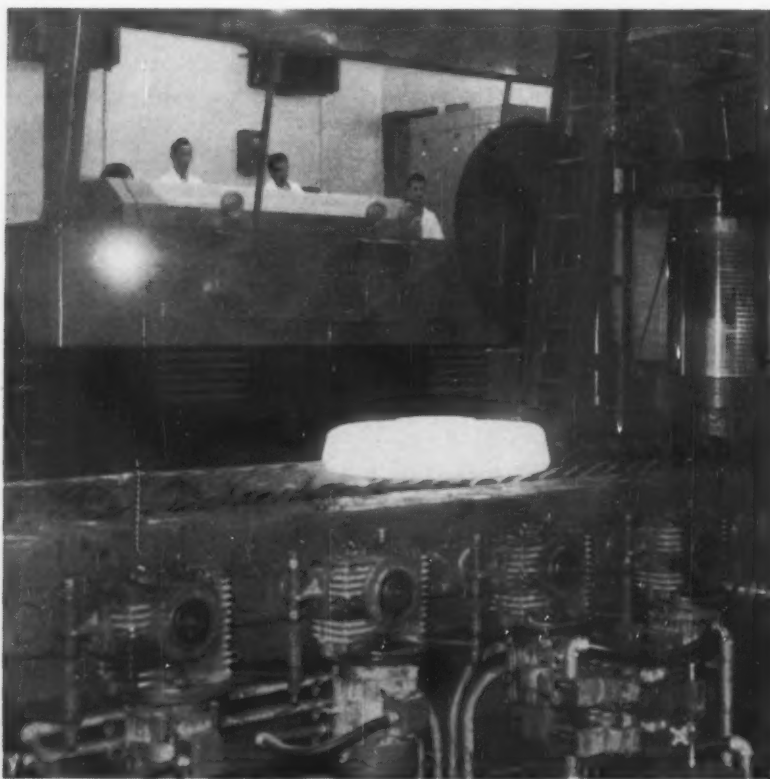
After sufficient cooling takes place, the wheels are dropped in the shot-blasting unit. Of course, the purpose is to remove any mill scale still clinging to the plates of the wheels.

Smooth Finish—High-production transfer units machine the wheels. These units are capable of machining 40 wheels per hour. Four vertical boring and turning mills perform any special machining required.

Every wheel passes through a high-powered magnetic crack detection unit. All diesel and heavy-duty wheels must undergo ultrasonic testing to search out any existing internal flaws.

Water Power—A high-pressure hydraulic system provides power for the forging and rolling shops. The system also consists of four 500-hp hydraulic pumps along with air accumulators having operating pressures of 4200 psi. These automatically-controlled pumps supply high-pressure water to the forging presses.

A 1500-hp generator supplies the power to the rolling mill. Electric control centers power equipment throughout the plant. Auxiliary generators, air compressors and a steam boiler complete the equipment in the power house.



FORGING ACTION: Automatically-controlled forging press reduces ingot blocks to flat disks prior to forming. Press capacity is 6000 tons.



Another Tinnerman Savings Story...

Easier, faster, better, cheaper...4 reasons to use **SPEED GRIP®** Nut Retainers

Easier ...because anyone anywhere on the J. I. Case tractor production line can snap the spring steel retaining legs of the SPEED GRIP into punched panel holes. No special skill required. Hole alignment is no problem — the nut "floats" inside the cage to compensate for normal tolerances in the parts being assembled.

Faster ...no staking, no welding. No retapping of paint-clogged threads because SPEED GRIPS can be applied *after* painting. And they pop quickly and easily into position for final assembly.

Better ...heavy-duty SPEED GRIPS make possible sturdy, reliable attachments because both the cage and the nut are made of high quality steel. In case of accidental cross-threading, the SPEED GRIP can easily be replaced. You never have to "make do" with a sub-strength fastening.

Cheaper ...J. I. Case estimates a savings of about 30% per fastener over the previous method.

Want to achieve these benefits of SPEED NUT Brand Fasteners for your product? Refer to your Sweet's Product Design File, section 7-Ti, then call your Tinnerman representative (listed in most Yellow Pages under "Fasteners"). Or write to:

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NEW



UM ULTRASONIC REFLECTOSCOPE

Now you get maximum economy, flexibility in ultrasonic testing equipment with Sperry's unitized Reflectoscope. The new UM design features low-cost interchangeable plug-in units so that various components can be accommodated. You get choice of frequency ranges, alarm and recording channels, attenuation correction, counting and totalizing channels. This economical building block method permits adding to instrumentation to meet increasing or changing testing requirements.

UI ULTRASONIC REFLECTOSCOPE

Latest concept in ultrasonic testing equipment. The most advanced instrument for lab and production line testing, compact for use on bridge or bench.

Plug-in receivers with frequency ranges from 1 to 25 mcs. Large 12" CRT with dual trace 2-color display. Double slope curves for distance amplitude correction — both near-zone and attenuation.

Exclusive features: Four instantaneous or continuous alarm channels with separate channel indication.



Write for descriptive literature.

Sperry Products Company

a division of Howe Sound Company
Danbury, Connecticut

FREE LITERATURE

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 113.

Specimen Polisher

An eight-page catalog describes an electrolytic polisher for metallographic specimen preparation. Features include an increased polishing area and an attachment for on-the-spot polishing and etching of large stationary objects. (William J. Hacker & Co., Inc.)

For free copy circle No. 1 on postcard, p. 113

Squirrel-Cage Motors

A bulletin describes high-speed squirrel-cage induction motors designed for dependable durable service in any installation. A split-bearing design permits bearing replacement without uncoupling the motor. (The Ideal Electric and Mfg. Co.)

For free copy circle No. 2 on postcard, p. 113

Ball-Bearing Tester

A four-page folder describes an electronic tester that predicts performance qualities of oil-lubricated precision ball bearings up to 1 in. OD. By revealing vibrational characteristics, it detects performance aspects not measurable by other types of testers. It thus screens bearings likely to cause rejection of completed assemblies. (The Barden Corp.)

For free copy circle No. 3 on postcard, p. 113

Meehanite Parts

A 16-page booklet illustrates a line of Meehanite bar stock, bushings, and shapes cast in standard stock sizes, and stresses the production cost savings that come with their use. Applications of these shapes in producing cams, pistons, gears, plates, and other parts are then illustrated. (Write on letterhead

to Mechanite Metal Corp., 714 North Ave., New Rochelle, N.Y.)

Manual Trip Controls

Revised and expanded to 16 pages, a catalog gives more application data and helpful ordering information on a manual trip control. It is designed to provide a safer and faster way to control machines with positive or friction clutches and pneumatic or hydraulic drives. (Micro Switch)

For free copy circle No. 4 on postcard, p. 113

Molded Delrin Parts

Designing with tiny injection-molded Delrin parts is the subject of an illustrated eight-page bulletin. Advantages of Delrin are covered. The author company offers volume production of precision components in this material, with maximum size 0.03 oz and 1¼ in. long, and no minimum size. (Gries Reproducer Corp.)

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Relay Control Amplifier

A four-page bulletin describes a high-gain dc-to-ac relay control amplifier. Sensitive and stable, it is particularly suited to instruments of laboratory accuracy as well as industrial process control and monitoring systems, such as high-speed, high-accuracy "go-no go" quality-control systems. (Thermo Electric Co., Inc.)

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Valves for Piping

"Recommended Piping Practice" is a wall chart for installation and maintenance personnel and for those ordering valves. It covers basic valve types, normally used connections, tools, installation, and operation and maintenance. (Lunkenheimer Co.)

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Precision Balls

An eight-page bulletin covers a complete line of precision balls of carbides, glass, ceramics, sapphire,



ULTRASONIC THICKNESS GAGE

Now you can measure wall thickness accurately with Sperry's new direct reading ultrasonic thickness gage. Battery-operated, it is small and light enough (10 lbs.) to be carried anywhere—to inspect missile nose cones, other rocket components.



Using the pulse echo method, this new Sperry thickness gage works even where surfaces are not parallel, such as taper forgings. Easy-to-read meter is directly calibrated in inches, and alarm lamps are provided for go-no-go operation. Send to Sperry for a free bulletin giving more detailed information on the new ultrasonic thickness gage.

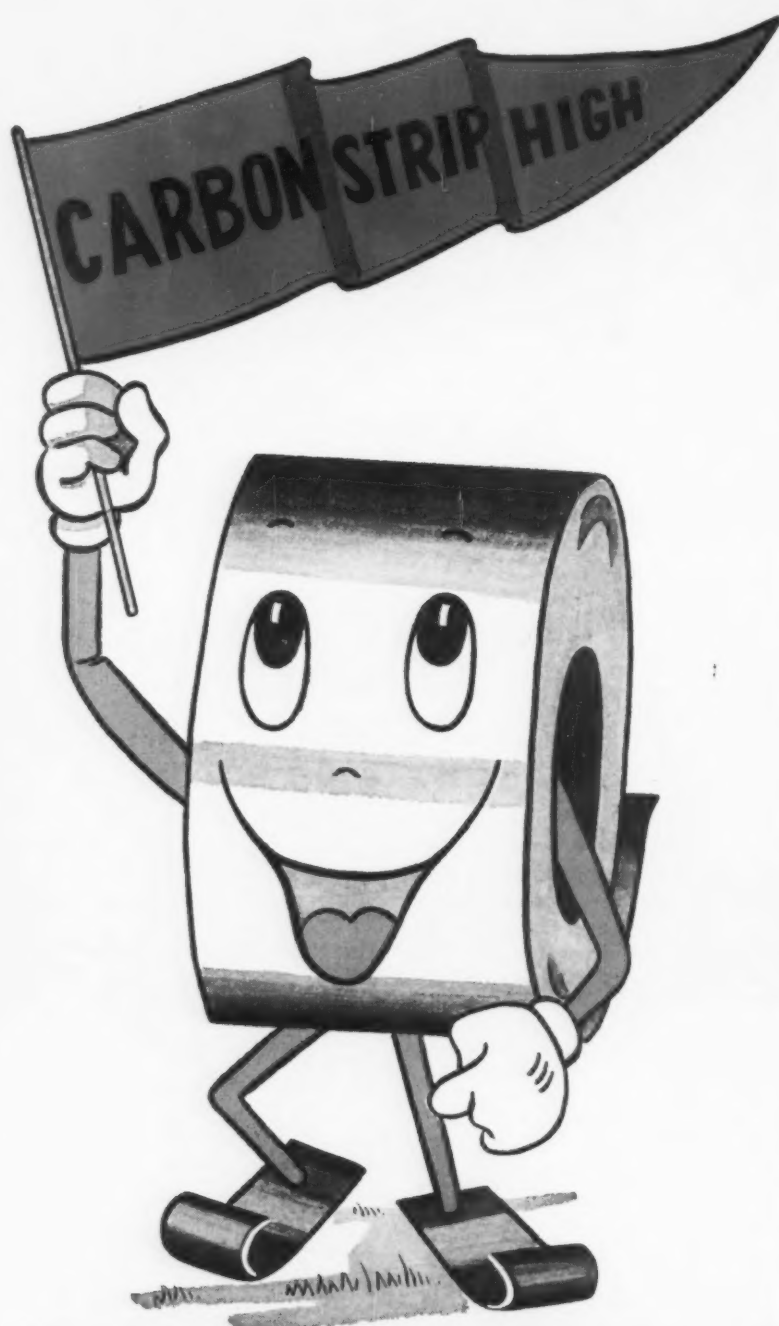
There is a full line of ultrasonic inspection instruments available from Sperry, for fourteen years leading designers and engineers of ultrasonic testing equipment. Call a Sperry engineer to help solve your ultrasonic testing problems.

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nylon, tungsten, HSS, and other materials. Various specially modified balls are illustrated. Methods of manufacture, precision, finish, sizes, and quantities are all discussed. (Industrial Tectonics, Inc.)

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Recirculated Gas

Recirculated gas is a development advanced by one company as the best method for obtaining the proper proportioning of heat within a steam generator. It is the subject of a 16-page bulletin. Its application to boiler design and operation is explained. (The Babcock & Wilcox Co.)

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Pneumatic Tools

A new series of pneumatic tools with larger, more powerful rotary-vane motors is detailed in a bulletin. The series is designed for cool-running, vibration-free operation at high speeds in heavy-duty metal and plastic finishing work. These tools come in straight or right-angle, for manual or machine operation. (Doe-den Tool Corp.)

For free copy circle No. 10 on postcard, p. 113

Small Electric Eyes

A 16-page booklet describes in detail miniaturized electric-eye applications for counting, sorting, monitoring, assembling, and automatic weighing as applied to packaging and general production. Equipment ranges from direct or partial cutoff to reflector-type units. (Photomation, Inc.)

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Gas Sampling Systems

Trouble-free gas-sampling service at moderate cost is provided by a "package" method of sampling-system selection. A system can be tailored by this method to any particular gas-sampling problem. (The Hays Corp.)

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with your maintenance man . . .



You'll find out, with . . .

Vertical Lift Metal-clad you perform normal breaker maintenance in 20 minutes

Ask your maintenance man which make of metal-clad switchgear is easiest and quickest to maintain, and it's an odds-on bet he'll tell you General Electric Vertical Lift.

He can show you why. For example, one man, in just 35 seconds, can remove the box barrier to inspect the

contacts. The arc chutes do not have to be removed. In fact, he can complete routine maintenance of an entire Vertical Lift breaker in 20 minutes or less. Saving his time saves you dollars. General Electric Company, Schenectady 5, New York.

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Switch to flash butt-welded compressor ring saves 21.5 lbs. of material—cuts machining time

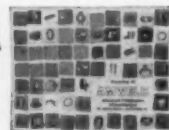
By selecting a special mill-rolled section close to finished dimensions, only 1/3 as much material was required to produce this ring. (Similar material savings could be realized on extruded sections.)

In addition, 45 minutes of expensive machining time were eliminated.

Flash butt-welded rings like this have been used in critical applications such as jet aircraft engines and present day missiles. They offer cost saving advantages in many fields, particularly where stainless or other heat or corrosion-resistant materials are employed.

Amweld's experience in forming, welding and machining circular parts is available to you. Write or call today. Or send blueprints and specifications—we will be glad to study your problem.

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A concentrated liquid wetting agent is particularly intended for use in strong oxidizing (chromic and nitric acid) solutions. It is very effective in all chromate processes for zinc, cadmium, silver, and aluminum. It is covered in a data sheet. (MacDermid Inc.)

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Floor Trucks

A 56-page catalog presents an expanded line of industrial hand floor trucks of all kinds, and certain accessories for them. Selection data are included. (The Hamilton Caster & Mfg. Co.)

For free copy circle No. 22 on postcard

Carbon-Steel Bars

A bulletin gives information on various types of cold-finished carbon-steel bars, including some leaded types. Full physical and working data are included. (Joseph T. Ryerson & Son, Inc.)

For free copy circle No. 23 on postcard

Process Equipment

A 12-page brochure covers a line of process equipment. Included are feeders, conveyors, coolers, dryers, weigh feeders, vibrating screens, bin check valves, and magnetic separators. (The Jeffrey Mfg. Co.)

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Wire in Design

A 22-page book presents case histories showing how designers cut costs and improved product quality and sales appeal through use of

wire and strip components. It describes wire types, finishes, sizes, and the variety of end treatments, threading, and forming possible. The author company's design and manufacturing facilities are covered. (E. H. Titchener & Co.)

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Acid-Resistant Alloy

A new alloy called Ni-o-nel is designed to handle severely corrosive hot acids and oxidizing chemicals. It withstands attack by phosphoric acid at all concentrations and temperatures, and offers excellent resistance to other common acid and oxidizing substances. Detailed information is contained in a booklet. (The International Nickel Co.)

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Furnace, Oven Controls

A 40-page booklet contains full information on a complete line of furnace and oven controls. (Minneapolis-Honeywell Regulator Co.)

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Plastic Moldings

A booklet describes and illustrates a company's facilities for making plastic moldings. Compression, transfer, and injection molding are available. Materials and part sizes available with each process are listed. (Continental - Diamond Fibre Corp.)

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Speed-Changing Gears

Space- and weight-saving gears for reducing or increasing speed on high-horsepower transmission applications are described in an eight-page illustrated bulletin. There are eight sizes of planetary and star gears for drives of various types. (De Laval Steam Turbine Co.)

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Aluminum Extrusions

A 12-page brochure on aluminum extrusions covers the process, extrusion types and shapes, available alloys, standard tolerances, and

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design considerations. The author company's services are described. (Precision Extrusions, Inc.)

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High-Strength Steel

A technical bulletin discusses applications of Viscount 44, a pre-hardened, machinable high-strength steel. A high-vanadium steel, it is furnished pre-hardened to Rc 42 to 46, and rates up to 200,000 psi tensile without further heat-treatment. Dies and machine parts are typical uses. (Latrobe Steel Co.)

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Steel Tubing

A four-page pamphlet covers specifications on Jal-Smooth, an electric-welded tubing cold-drawn to close tolerances, high surface hardness, excellent ID finish, and improved concentricity. It can be used in the as-received condition for cylinder-type parts of all kinds. (Jones & Laughlin Steel Corp.)

For free copy circle No. 32 on postcard

Flush Fasteners

A four-page brochure describes a line of self-clinching nuts, captive studs, and flush-head studs. They are designed to save time, labor, and weight in sheet-metal assembly operations. (Penn Engineering & Mfg. Corp.)

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Safety Starters

Six important safety features of new-type combination safety starters are discussed in a booklet. These starters are for controlling industrial equipment such as heavy machine tools. (Westinghouse Electric Corp.)

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Hydraulic Pump

Operating at 90-pct overall efficiency, a small hydraulic pump weighing only 55 lb rates at 8.5 gpm at 1200 rpm and 3000 psi. It

can also operate at 5000 psi. Various controls and standard mountings are available. (The Kline Mfg. Co.)

For free copy circle No. 35 on postcard

Meehanite Stock

A stock and price list shows various Meehanite forms available from a foundry. They include bushings, gear blanks, and round, rectangular, and square bar stock in various lengths and dimensions. Physical data are included on the material used, GB Meehanite. (Ross-Meehan Foundries)

For free copy circle No. 36 on postcard

Optical Tooling

"Optical Tooling and Industrial Alignment Equipment" is a 25-page illustrated catalog covering a complete line of equipment for production tooling, machine alignment, quality control, and inspection. (Keuffel & Esser Co.)

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Automatic Weighing

A bulletin explains the application of a company's standardized system of instrumentation to batch and continuous weighing methods. Unitized systems of pre-engineered components permit automatic measurement and control. (Weighing & Control Components, Inc.)

For free copy circle No. 38 on postcard

Automatic Soldering

A technical guide covers automatic soldering with solder pre-forms. It covers selection and use of solder alloys and fluxes, and describes flux-filled washers. (Alpha Metals, Inc.)

For free copy circle No. 39 on postcard

Elbow Fans

Axial-flow elbow fans for ventilation and for ovens, furnaces, dryers, and kilns, are described in a four-page bulletin. With non-overloading characteristics, they can handle air in any condition at any temperature. (L. J. Wing Mfg. Co.)

For free copy circle No. 40 on postcard

Have you sent for this FREE book and calculator?

Here is a new book, written in simple language, that describes the "Do's" and "Don'ts" in welding USS "T-1" Steel. Included in the booklet is a handy heat input circular computer that helps you choose the proper welding machine settings. Both will help every welder to do a more reliable job and make his work easier.

USS "T-1" Steel has become famous for three properties not usually found in a single steel: very high yield strength, excellent toughness and good weldability. The booklet will tell you how to weld "T-1" Steel successfully without affecting either its strength or toughness.

The information is based on the experience of our many field service men whose jobs are to help customers fabricate "T-1" Steel. It contains the results of nine years of work with hundreds of users, and shows how to apply common practices in the welding of "T-1" Steel.

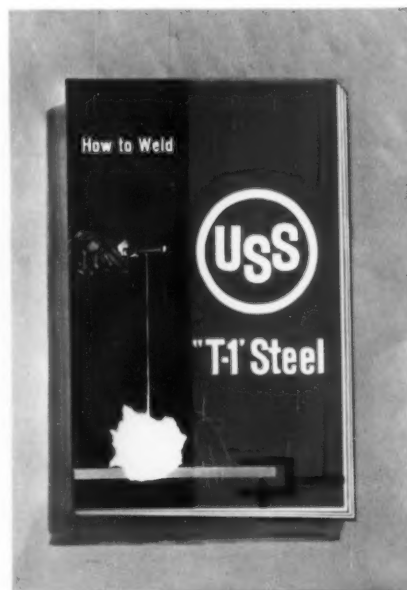
As the booklet points out, welding of USS "T-1" Steel is not particularly difficult—but it is different than welding most other high-strength structural steels. To do it correctly requires some basic knowledge of the metal, of the electrodes, and the proper welding procedures.

We'll gladly send you enough free copies of the booklet for your weld shop personnel. Just send the coupon.

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Gentlemen:

Please send me _____ copies of your new 24-page booklet, "How to Weld USS T-1 Steel," including the handy heat input calculator.

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State _____

This is a space ship floor maker

Sometime within the next several years, the first American will soar into orbit around the earth. He will be sealed in a small, cone-shaped space capsule mounted atop an Atlas missile. The missile will climb 100 miles in less than six minutes, where the capsule will disengage and go into orbit. The man will be alone in space.

The vehicle for this historic voyage is already in production, under the auspices of the National Aeronautics and Space Administration's "Project Mercury." One of the possible methods of heat protection is a beryllium heat sink, forged on two giant steel dies. Both dies are USS Quality Steel Forgings. The top die (shown being rough-machined on one of our vertical boring mills) will be convex, 20 inches thick and will weigh 26,520 pounds. The bottom die, concave and 18 inches thick, weighs 27,700 pounds. Both are 92 inches in diameter.

The heat sink of the space capsule will also be its leading face when re-entering the atmosphere. It will be traveling 18,000 miles per hour, subject to thousands of degrees of temperature and many times the force of gravity. Naturally, it has to have superb strength and heat-resistant characteristics. By the same token, the dies that shaped the capsule floor had to be perfect.

After forging, both dies were subjected to preliminary heat treating and preliminary machining. Then came quenching and tempering. A battery of tests followed: ultrasonic inspection, tangential tensile tests, Charpy V notch impact tests, grain size tests, bend tests and magnetic particle inspection. Only then were the dies ready to take the incredible forging pressure, exerted by the giant hydraulic closed-die forging press where the beryllium disc was formed.

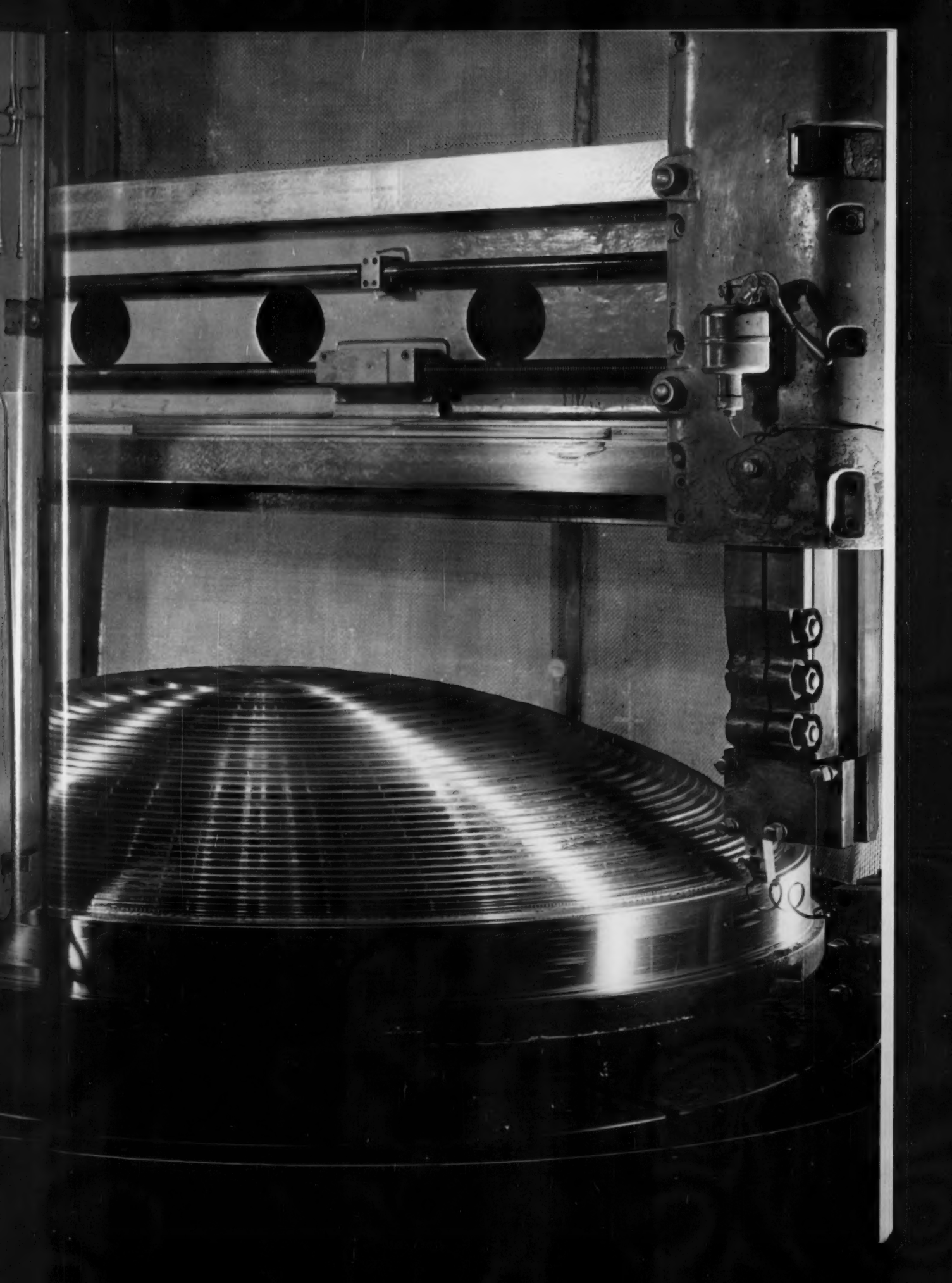
We invite your inquiries or requests for our free 32-page booklet on USS Quality Forgings. Just write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel







Wood proves Stainless Steel is simple to fabricate



General Sales Manager, C. Paul Carlson, points to the Stainless Steel milk cans designed and manufactured by the John Wood Company.

There's probably no one that has more experience and know-how with Stainless Steel fabrication than the John Wood Company. At eight different plants in the U. S. and Canada, the company makes everything from gasoline pumps to milk strainers. At their St. Paul plant they are equipped to produce 50% of the Stainless Steel can requirements for the entire dairy and dispenser industries.

The company worked closely with sanitation experts and health officials to design a Stainless Steel can that meets the strictest regulations for both material and workmanship. And at the same time, they found ways to simplify fabrication and save time and materials. They developed methods of hydraulic forming, welding, grinding and polishing that have paid off in lower costs and a quality product. These Stainless cans have a hard, durable finish that is easy to clean, ready for long, sanitary service. The John Wood Company proved that Stainless Steel isn't difficult to fabricate, it's just different.

If you would like to have complete information about working with Stainless Steel, write for a free copy of our *Stainless Steel Fabrication Book*. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark



United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

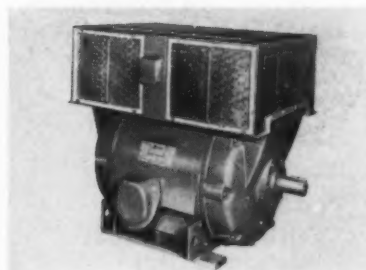
New Materials and Components

Drive Motors for Contaminated Atmospheres

New drive motors are designed for metalworking machines of all types. They are high-slip, high-starting-torque, low-starting-current, and are recommended wherever extremely dirty atmosphere, or high concentration of oil, moisture, or chemicals is present. They come in

frames 182 to 8120, in four general types. These are dripproof, totally enclosed fan-cooled, explosion-proof, and forced-ventilated. The last are used wherever extra cooling is required. (Westinghouse Electric Corp.)

For more data circle No. 41 on postcard, p. 113

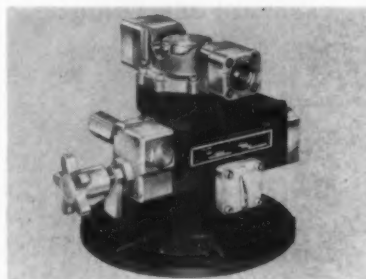


Lightweight Variable-Volume Hydraulic Pump

A variable-volume, axial-piston hydraulic pump which weighs only 55 lb is good for high- or low-speed use. Operating at 90-pct over-all efficiency, it produces 1.99 cu in. per revolution from 1200 to 4000 rpm at either 3000- or 5000-psi op-

eration. Capacity is 8.5 gpm at 1200 rpm, 3000 psi. It features very fast compensator control, with clockwise or counterclockwise rotation optional. A variety of mountings and controls are available to cover all applications. (The Kline Mfg. Co.)

For more data circle No. 42 on postcard, p. 113

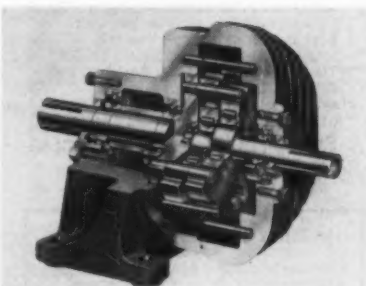


Cycloid Reduction Drives Cut Space and Weight

Reduction drives based on the cycloid principle are 40 to 60 pct smaller than other types of reducers with comparable ratings. They also provide higher torque, ranging from 30 to 80 in.-lb per pound of reducer weight, and have a wider range of torque, pound for pound. Running

very quiet in an oil-sealed cast-iron housing, they have a number of teeth carrying the load at all times for a minimum of wear. Sizes vary from small units for instruments to large machine-tool drives. (Black Tool, Inc.)

For more data circle No. 43 on postcard, p. 113

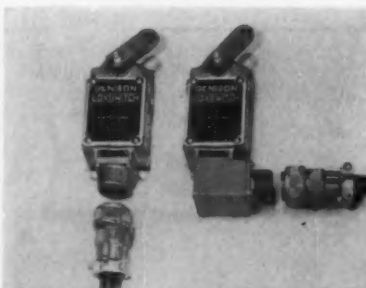


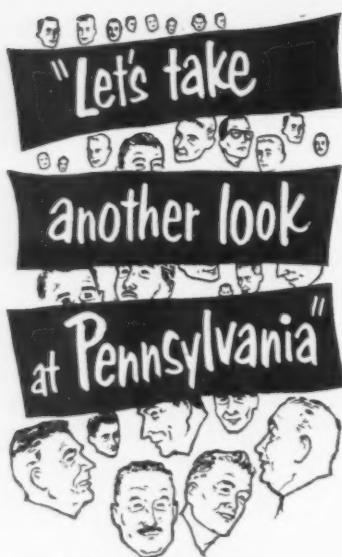
Plug-In Limit Switches Are Completely Sealed

Incorporating a completely sealed plug-in electrical connection, new limit switches come in both straight and right-angle styles. The male connection is permanently attached so it cannot be accidentally unscrewed, breaking the watertight seal or damaging the wiring. The

cord half is a female plug and screw collar on No. 14 neoprene-covered type S.O. machine-tool cable. Joined, the two units provide a mechanically strong, sealed connection between cable and switch. (R. B. Denison Mfg. Co.)

For more data circle No. 44 on postcard, p. 113





...that's what a growing number of industrial executives are saying and doing!

For the three and a half years—'56, '57, '58, and '59 to date, they announced:

307 NEW PLANTS
258 RE-OPENINGS
 OF IDLE PLANTS
666 PLANT EXPANSIONS

(Send for the list—address below)

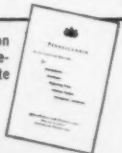
They are finding:

Surplus of industry-minded workers . . . Strategic locations in the great Eastern market with access to major trunk line railroads, and modern highway and Turnpike networks . . . Ports on the Atlantic, St. Lawrence Seaway and Ohio River system . . . All types of industrial raw materials and components . . . 100% low-interest plant financing in labor surplus areas . . . Choice of industrial "parks" and individual plant sites.

In Terms of Taxes:

- No state property tax
- No state tax on personal income
- Manufacturing exemption for capital stock and franchise taxes
- Low local property taxes
- No tax on machinery or inventories

For free copy of "Plant Location Services" pamphlet, or for details on 100% financing, write or call:



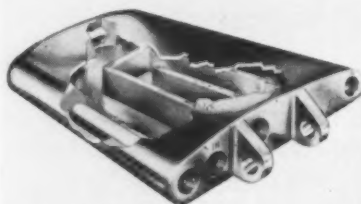
Pennsylvania Department of Commerce

South Office Building
 605 State Street, Harrisburg, Pa.
 Phone: CEdar 4-2912

DESIGN DIGEST

Furnace Bosh Plates

Blast-furnace bosh plates have a double cooling chamber for longer life and reduced replacement labor cost. An outer chamber protects the nose, exposed to highest heat. The inner chamber can have cast-in



baffles of any shape. The chambers have separate cooling-water connections, and if either fails the other can operate independently. (Philadelphia Bronze & Brass Corp.)

For more data circle No. 45 on postcard, p. 113

Aluminum Alloy

A new aluminum alloy can be cast to the higher strengths necessary for advanced missile and aircraft components. An important feature is the addition of a small amount of beryllium, which modifies iron impurities picked up during melting and pouring, and keeps the casting's strength unimpaired. Experience has shown that higher tensile strengths are possible with castings of this alloy than with conventional castings from high-purity aluminum. (Navan Products, Inc.)

For more data circle No. 46 on postcard, p. 113

Rolled Zinc Alloys

New zinc alloys have exceptional resistance to creep and grain growth and exceptionally low coefficients of linear expansion. A typical alloy containing 0.8 pct copper, 0.15 pct titanium, balance zinc, can be rolled to have a creep rate of more than 5,000 days per 1-pct elongation under 10,000-psi load at 25°C—a change in length of 1 pct per 13.5 years. Thus, these alloys may be used in applications where constant moderate

loading conditions are present and other commercial zinc alloys have been unable to stand the load. They also resist grain growth during annealing. They can be heated to near melting without significant change in physical properties. This is of value where high temperature cycles are used, as in japanning and lacquering. They have good drawing, forming, and plating characteristics and compare with other zinc alloys in corrosion resistance. (The New Jersey Zinc Co.)

For more data circle No. 47 on postcard, p. 113

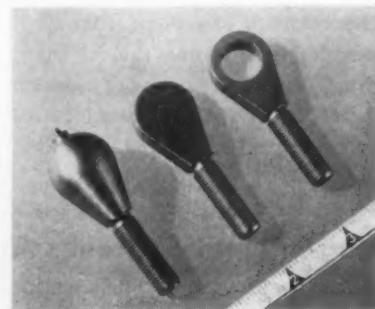
Metal Primer

A new metal primer—spray or brush type—dries in 20 minutes, and is compatible with almost any finish coat. A phenolic resin penetrant carries pigment and vehicle through sound rust, locks to the substrate, seals the surface, and locks out moisture and prevents further rust development. The saturating action neutralizes porous rust and makes it an actual ingredient of the paint film. (Krylon, Inc.)

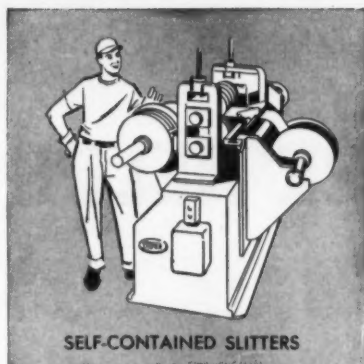
For more data circle No. 48 on postcard, p. 113

Free-Cutting Stainless

A switch from a chrome-moly alloy steel to free-machining stainless increased production 80 pct, eliminated rejects, which had run 25 pct, and cut overall fabricating costs. The former material was worked on a turret lathe, and cad-



mium-plated. There were difficulties in machining, holding tolerances, and finishing. Threads came out rough, and straddle milling could not be done to required 63 finish. Plating built up on the rough threads, and the milled surfaces



YODER SLITTERS

basic equipment for cost-conscious users of strip!

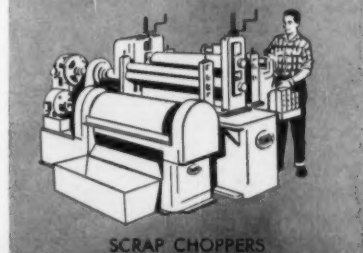
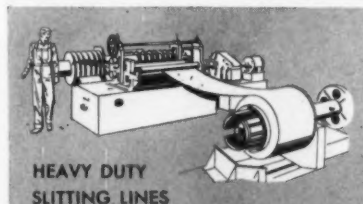
To help meet the demands of tight production schedules, YODER Slitters reduce mill-width stock quickly and economically to desired widths. If your needs are as low as 100 tons per month, time and manpower savings alone will offset the cost of your YODER Slitter in a matter of months, while reducing basic inventories. Compactly designed, standard YODER Slitters are built to handle standard coil widths... completely engineered lines for special requirements.

YODER accessories, such as coil cars, swivel unloaders, scrap choppers, scrap disposers, plate levelers and coil boxes, make stock handling fast and easy.

YODER also makes a complete line of Cold Roll-Forming equipment and Pipe and Tube Mills. To profit from YODER'S years of engineering and service experience, contact your local YODER representative or send for the fully illustrated descriptive, YODER Slitter Manual; it's yours for the asking. Write to

THE YODER COMPANY

5510 Walworth Ave. • Cleveland, Ohio



had to be finish ground. Further, the rough threads had to be vapor-blasted and buffed. AISI Type 416 stainless furnished identical tensile strength and solved all problems. Plating was dispensed with, as parts were passivated, and at smaller cost. Machinability was enough better to raise production 80 pct and eliminate all the former bad results. (Carpenter Steel Co.)

For more data circle No. 49 on postcard, p. 113

Bright Copper Plater

A bright copper cyanide process results in smooth, bright deposits over a wide temperature and current-density range, good metal distribution, and simplicity of operating and controlling the solution. Deposits do not require activation before subsequent nickel plating. (Hanson-Van Winkle-Munning Co.)

For more data circle No. 50 on postcard, p. 113

"Dry" Phosphatizing

A new "dry" phosphatizing process eliminates water solutions and puts phosphate coatings on parts at savings in equipment investment, floor space, and operating costs. Parts are phosphatized by dipping or spraying with a trichlorethylene-based phosphatizing solution maintained at its boiling point, 188°F. This degreasing and phosphatizing together uses very little more solvent than does degreasing alone. A painting process using the same solvent as the thinner can be added, to complete the finishing system. (E. I. Du Pont de Nemours & Co.)

For more data circle No. 51 on postcard, p. 113

Pyramidal Lockwasher

A pyramidal lockwasher, so-called, serves to fasten sheets securely together to avoid shifting. An integral piece, it is hexagonal in outline, dished in contour, and pierced with a clover-leaf-shaped hole. Spanning large clearance holes, with points at the corners, it stays put and provides the tension needed to keep parts securely fastened and in alignment. (Shake-proof Div., Illinois Tool Works)

For more data circle No. 52 on postcard, p. 113

Tempilstik®

*temperature
indicating
crayons**



Tempilstik®—a simple and accurate means of determining preheating and stress relieving temperatures in welding operations. Widely used in all heat treating—as well as in hundreds of other heat-dependent processes in industry. Available in 80 different temperature ratings from 113°F to 2500°F... \$2.00 each.

Send for free sample Tempil® Pellets. State temperature desired... Sorry, no sample Tempilstiks®

Most industrial and welding supply houses carry Tempilstiks®... if yours does not, write for information to:

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PACKAGED for
YOUR PRODUCTION

CF&I WIRE HELPS

"CF&I-Wickwire Wire Spiders give us 25% Increase in productivity...20% less downtime... 80% less scrap loss," says Mr. Robert Mangold, Production Superintendent.

25% Increased Production—"Previously it required fifteen or twenty minutes to reset *each* of the eight to ten small coils used to feed our forming machine," explained Mr. Mangold. "For every eight hour shift, we lost two hours of production. Now with CF&I Spiders—which hold up to a 3000 lb. continuous length of wire—we change coils only once each shift. We save two hours per shift."

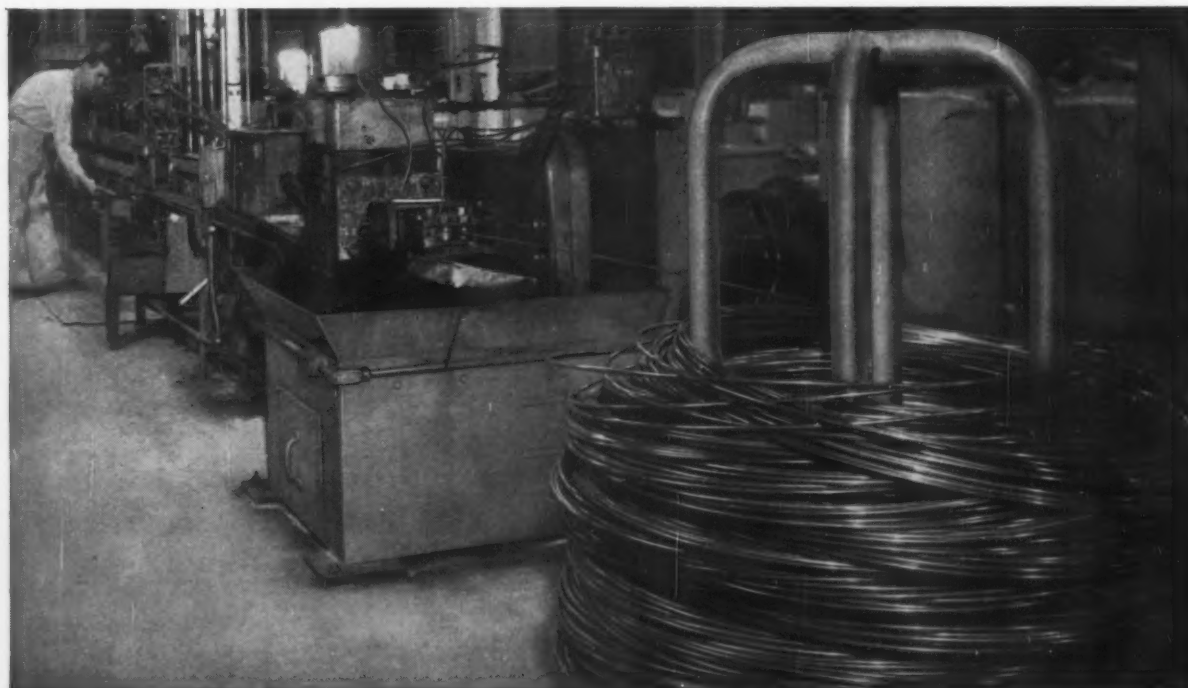
80% Less Scrap Loss—"Waste is an important consideration because we lost several feet every time we changed coils. Now we use only one and one-third CF&I Spiders each shift—instead of the eight or ten coils used previously—and have cut our waste 80%."

Increased Safety—"With small coils there was always the danger of the finishing end springing loose while rotating

and striking equipment and personnel. With heavy-weight CF&I Spiders which revolve on a turntable while our machine withdraws the wire, the finishing end is securely anchored, reducing the possibility of tangling and eliminating this danger."

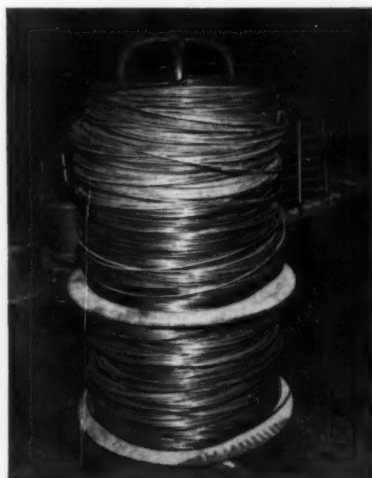
Improved Quality of End Products—"Since we do not have to reset the machine ten times a shift, the quality of our product is more uniform and we have fewer rejects," declared the superintendent of production. For a continuous operation, the end of one Spider can be butt welded to the start of another.

Reduced Handling Costs—"These sturdy Spiders have reduced our handling and storage problems, because each



INCREASE PRODUCTION 25%, CUT MANUFACTURING COSTS

At Bridgeport Brass Co., Flemington, N. J.



Spider contains as much wire as eight small coils. Unloading is safe and quick—one man with a fork lift can do the job easily, freeing several men for other important operations," Mr. Mangold pointed out.

Simplified Inventory Control—No need to sort through piles of wire coils...simply count the number of upright Spiders.

Save Storage Space—Spiders are stored compactly, requiring much less space than cumbersome coils. For maximum economy of space, Spiders can be doubled-decked which is equivalent to stacking 20 mill coils of 300 lbs.

Every CF&I Wire package offers one or more of the following benefits:

- Reduced downtime through extra long continuous lengths of wire
- Simplified inventory control
- Fast, economical unloading and in-plant handling
- Continued cleanliness of the wire

A CF&I representative will be glad to discuss your operation with you and recommend the wire package that will help save you time and money.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION



In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

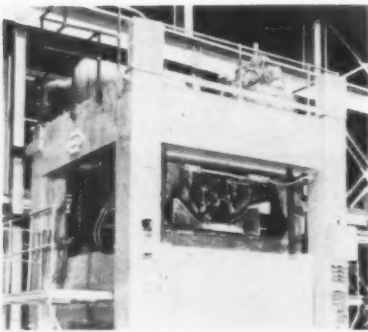
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CF&I OFFICE IN CANADA: Montreal

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

4930

New Equipment and Machinery

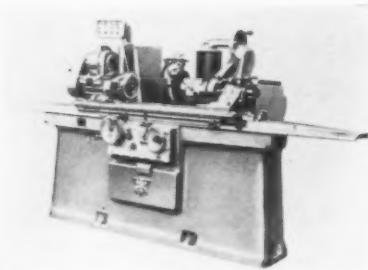


Mechanical Piercing Press Has Hydraulic "Bite"

Illustrated is a new solution to an old production headache—multiple piercing on a complex drawn part. The new method increases the accuracy of the work and enables sizeable savings in tooling and equipment. A mechanical press embodies a gang of hydraulic piercing cylinders. It is shown working fender skirts. Upward motion

cuts right- and left-hand skirts apart and clamps them in position. At the top a battery of 20 hydraulic cylinders pierces 47 holes. Auxiliary feeding and unloading equipment make this a completely automatic operation, with an output of 900 fender skirts per hour. (Danly Machine Specialties, Inc.)

For more data circle No. 53 on postcard, p. 113

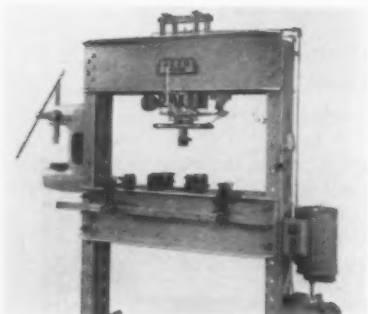


Three New Cylindrical Grinder Models

Three cylindrical grinders do straight or taper finishes to 1 microin. and parallel-grind to 0.00025 in. in the center over 24 in. They provide shockless table reversal, with accuracy of 0.0005 in. at maximum speed. Table traverse is hydraulic, variable. Fine hand

traverse permits delicate shoulder grinding. Reversal infeed is 1 to 6 tenths. These models grind between-centers lengths of 18, 27, and 40 in., diam 8 to 10 in. There are four wheelhead models for various uses. (Micromatic Hone Corp.)

For more data circle No. 54 on postcard, p. 113

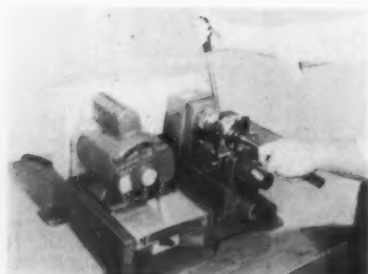


Hydraulic Presses Are Versatile for Heavy Duty

Two motorized hydraulic presses have pressures of 60 and 80 tons. They feature enclosed, filtered hydraulic systems and rugged structural-steel construction. A convenient handwheel permits rapid approach and reserves the full power stroke for the work. Large daylight is provided for in both

models. A safety bypass valve prevents any possibility of overloading the press. A pressure gage shows the operator when full capacity is being reached. Both 60- and 80-ton models come with either 2- or 5-hp motor. (ACCO Equipment Div., American Chain & Cable Co., Inc.)

For more data circle No. 55 on postcard, p. 113



Performs All Operations on Rod, Tube Ends

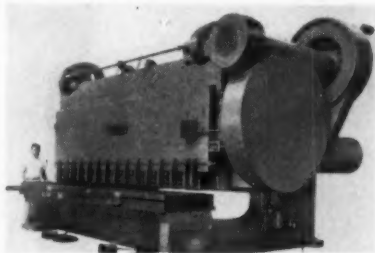
An end-finisher in one pass performs deburring, facing, and chamfering, as well as drilling, reaming, and light spinning operations, on tube and rod ends. Easy to set up and operate, it has controlled alignment between the work-holding jaws and the rotating tool holder.

Even unskilled operators can finish up to 800 ends per hour. There are eight spindle speeds from 760 to 3920 rpm, with speed changes quickly and easily made. A positive stock stop is easy to set up. (Pines Engineering Co., Inc.)

For more data circle No. 56 on postcard, p. 113

1 1/4-in.-Capacity Shear

A new shear cuts mild steel plate 14 ft long, up to 1 1/4-in. thick. It has hydraulic holddowns, a front-



operated power back gage, automatic pressure lubrication, and a forged alloy-steel eccentric shaft. (The Cincinnati Shaper Co.)

For more data circle No. 57 on postcard, p. 113

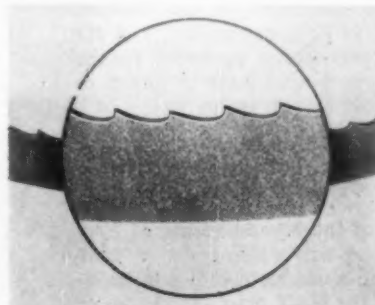
Rotary Tables

Rotary positioning tables for both vertical and horizontal use come in sizes of 9, 12, and 15 in. They feature quick worm engagement and disengagement, precision-ground surfaces, 1-minute-graduated dials, and wear-compensating adjustment. Their accuracy is guaranteed to 60 seconds or less through 360° of rotation. (Troyke Mfg. Co.)

For more data circle No. 58 on postcard, p. 113

HSS Saw Band

A new all-HSS saw band that retains hardness even to red-hot 1100°F temperatures permits greater tension and higher speeds and feeds for cutting the hardest and toughest materials. Thicknesses



range from 25 to 42 thousandths. Controlled hardness of the band ranges from a super-hard cutting edge to a super-tough flexible back. It welds satisfactorily. It will cut up to 10 times faster with cutting life

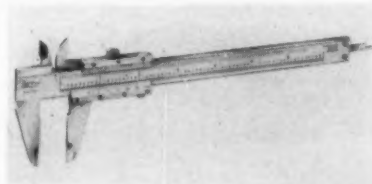
up to 30 times greater than regular blades. It is available in regular, hook-tooth, and skip-tooth types, in four widths, and in a wide variety of pitches. (The L. S. Starrett Co.)

For more data circle No. 59 on postcard, p. 113

Vernier Caliper

A vernier caliper features an adjustable vernier plate resettable to compensate for wear and resurfacing of measuring faces. It makes ID, OD, and root measurements of gears

and threads, in addition to ordinary uses, and can be used as a depth gage. Of stainless steel, it has an



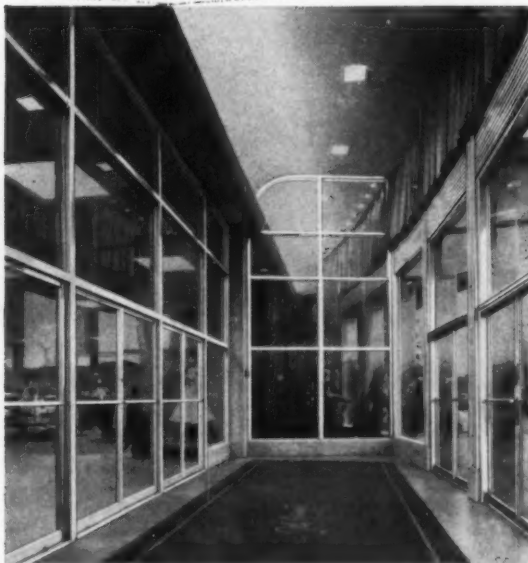
extra-long vernier for easy reading. Measuring capacity is 5 3/4 in. (The Lufkin Rule Co.)

For more data circle No. 60 on postcard, p. 113

Versatility Unlimited



In the modern store MicroRold Stainless Steel adds elegance... lessens maintenance



John Wanamaker store Wynnewood, Pa.

There's no compromise in quality and durability—when you select gleaming, lifetime stainless steel for buildings, storefronts and entrances. As a functional and decorative companion to wide glass areas, stainless steel is engineered to perform perfectly—year after year after year. The fact that stainless steel's beauty is permanent—and so easy to maintain—makes it the most practical choice in contemporary design.



Specify MICROROLD STAINLESS SHEET AND STRIP, available from local steel service centers in all architectural grades, thicknesses, finishes and textures. Send for your free copy, Bulletin 259, A.I.A. File 15-H-1, "ARCHITECTURAL STAINLESS ENGINEERING DATA."

Washington Steel Corporation

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WASHINGTON, PA.



World's safest safe

welded with M&T Murex electrodes

Guarding the nation's most treasured documents is a job entrusted to what is probably the world's safest safe. Nightly, or in emergencies, cases containing the Declaration of Independence, Constitution and Bill of Rights are automatically lowered into the safe which protects the documents behind mammoth self-locking doors. In its construction, the Mosler Safe Company depended on M&T Murex electrodes.

This is one of a whole host of vital jobs being done with Murex electrodes. Other examples: Behlen Frameless Metal Buildings, which have survived what is probably the world's toughest single test—a nuclear blast—rely heavily on

welds with Murex electrodes in commercial, school and farm building construction. And for the world's best cars—those produced in the U.S.—more than one out of four is joined or unitized with reliable Murex welds.

So it goes. Where there is dependence on the integrity of welds, there is dependence on M&T Murex electrodes . . . and welding machines, too.

M&T offers one of the broadest lines of electrodes and wires for arc welding—over 1000 types and sizes; and a complete choice of welding machines. Ask the M&T man for details or recommendations. Or send for literature.



**welding products • plating products
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METAL & THERMIT CORPORATION, General Offices: Rahway, New Jersey

The Iron Age Summary

Can Shipments Keep Improving?

Steel shipments are coming along better than expected. Problem now is to get the pipelines filled.

Right now, shortages are holding back manufacturing and a further shipping lag is a possibility.

■ Shipments of finished steel are running ahead of mill timetables. But real relief for steel users is still some weeks off and industrial attrition for lack of steel will persist.

In spite of better-than-expected performance at the mills, a major question on supply remains to be answered: How fast can new steel move through the pipelines?

Conversion Helps—If mills are to keep shipments moving up, they will have to process new ingots before old stocks run out. There still could be a shipping lag, but so far, most problems have been less than expected.

One big reason behind the good rate of shipments: Automakers

loaded up with conversion steel and are placing sizable tonnages of ingots and semi-finished steel into the mill pipelines.

Shipment Outlook—The outlook now is for mills to ship about 8 million tons in December and for customers to add about 2 million tons to inventory. However, the inventory buildup will be largely statistical. Part of it will be in transit. Another part of it is necessary buildup of balanced stocks before users can resume production.

Right now, steel consumption is running at the rate of 5 million tons a month. Earlier in the year, consumption was close to 7 million tons a month. The lag is strictly because of lack of steel, not because of any lag in manufacturers' production hopes.

Consumption Climbs—Biggest part of the drop came from the cutbacks in the auto industry. Production in November was a scant 250,000 cars, compared with a scheduled figure of some 600,000. In addition, there have been freight

car losses, limited appliance production, in the general slowdown.

As steel starts to move, consumption should reach 6 million tons in December. Steel use in January is still expected to be less than normal, while consumers fight to bring their inventories back into balance.

Wait Till February—Full industrial production is not expected to be reached much before February. By then, consumption will come very close to total steel production and inventory buildup will be negligible.

While market conditions are hectic now, some think the real jam won't come before a couple more weeks as more users run out of steel. Smaller steel customers are most frantic.

Imports Drop—Some customers who had gone to imports are now trying to renew domestic purchases. Imports in the Midwest are drying up now that the St. Lawrence Seaway is closed and prices are now up to domestic levels.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,591	2,208	368	2,003
Ingot Index				
(1947-1949=100)	155.1	137.5	22.9	124.7
Operating Rates				
Chicago	90.0	74.0	5.0	85.0
Pittsburgh	90.0	76.0	4.0	67.0
Philadelphia	92.0	92.0	12.0	72.0
Valley	82.0	75.0*	10.0	54.5
West	80.0	80.0*	0.0	83.0
Cleveland	85.0	77.0*	0.0	71.0
Detroit	85.0	77.0*	24.0	94.0
Buffalo	100.0	100.0	0.0	68.0
South Ohio River	95.0	89.0*	70.0	85.0
South	83.0	60.0	12.5	60.5
Upper Ohio River	88.0	87.5	58.0	82.5
St. Louis	90.0	90.0	102.0	91.0
Aggregate	88.0	78.0	13.0	74.2

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	\$66.41	\$66.41	\$66.41	\$66.41
Scrap No. 1 hvy (Gross ton)	\$44.17	\$46.17	\$46.17	\$40.50
No. 2 bundles	\$30.50	\$31.83	\$31.50	\$29.00
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.80
Copper, electrolytic	30-33	30-33	30-31.50	29.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	100.75	101.00	101.75	99.25
Zinc, E. St. Louis	12.50	12.50	12.5-13	11.50

Bearing Steel Supplies Dwindle

Bearing sales are good if you have steel, but many producers are running out of stock.

Barring a steel price rise, bearing prices should hold until spring. But there will probably be a price change anyway sometime in 1960.

■ If you have steel, bearings sales are great. But some of the largest producers are down to bare poles, with wholesale closings scheduled this month.

New Departure, for example, shut down its Bristol and Meriden, Conn., plants Nov. 20. Reopening date hangs on steel deliveries. But order backlog is high, with new business coming in at a brisk clip.

Full Day—Norma-Hoffmann re-

ports its present steel stocks should last through January. It is now working around the clock, with order volume still accelerating. It currently has orders running into the second quarter, and cancellations or delivery stretch-outs are rare.

Orders to bearing makers with steel come from all segments of metalworking. Portable tools, electric motors and office equipment industries continue to be growing markets. And demand is strong for virtually all sizes and types.

Ample Supply—Both demand and supply of miniature bearings continue at high levels. Miniature Precision Bearing Co. and New Hampshire Ball Bearings, Inc., report steel supplies ample for several months. A. N. Daniels, president, of New Hampshire, adds that most

of his firm's product is made from AISI 430C stainless. This is made chiefly by specialty mills, many of which have had no stoppage.

Worries that users of miniature bearings would be forced to slow down because of the steel strike have proved groundless. Eighty to 90 pct of such bearings are used for defense, which carries a priority on available steel. And a large part of related components are special alloys or aluminum. So any slowdown will probably be limited to isolated situations.

Logjam Possible—If scheduled plant shutdowns among bearings makers are long-lasting, a logjam in post-steel-strike deliveries is a distinct possibility. And it is complicated by the fact that no one can tell when steel deliveries will be made.

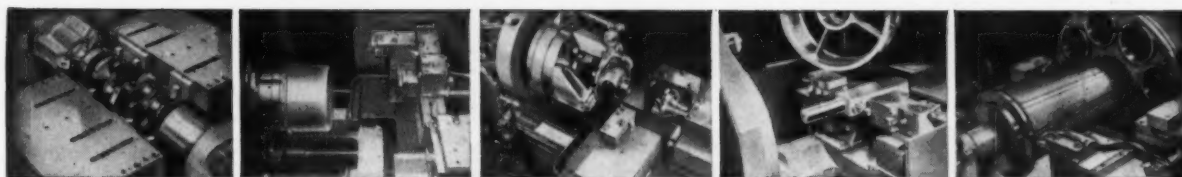
"Anticipate," producers warn bearings buyers. For many users, getting on the books now will be a wise precaution to hedge against shortages later on this winter or spring. Companies still operating warn that deliveries are starting to lengthen—slowly so far, but a deluge of orders is not impossible.

Another Look—Assuming no price increase in steel, present bearings prices should hold fast until spring at least. A steel price rise would force an increase sooner, but lacking that pressure, present levels should hold for several months. However, there are other costs besides steel. A re-examination of prices will probably become inevitable during the second quarter.

Meanwhile the industry and its customers hang on the steel labor picture. Barring an unexpected sudden steel labor settlement, a bearings shortage early in 1960 is an ominous outlook.



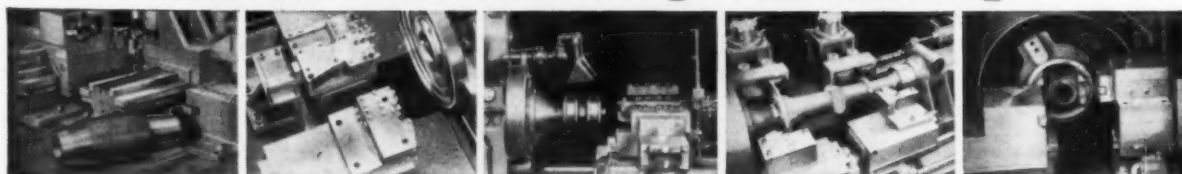
CLOSE WATCH: An operator at the Norma-Hoffmann Bearings Corp. checks finished bearings for defects. The electric amplifier is so sensitive it reads in steps of 0.0000025 in. Close measurement is needed for maximum production accuracy and detection of deviations.



All these different tooling setups



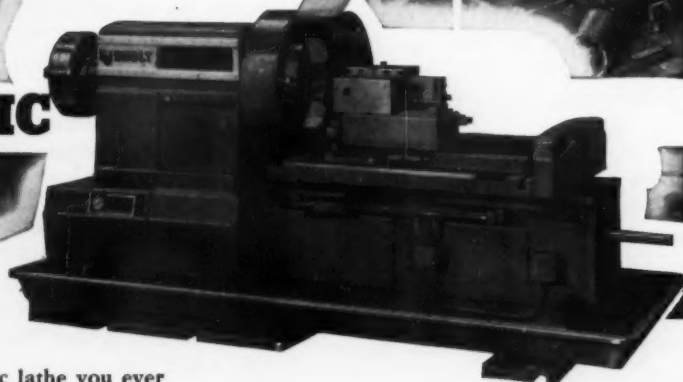
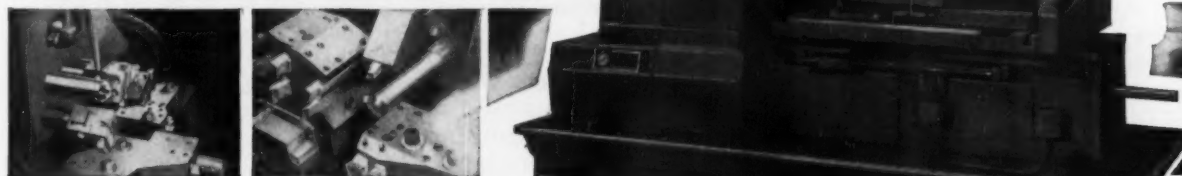
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Tinplate Users Face Rough First Half

Canmakers piled up tinplate supplies before the steel strike began.

Now these stocks are gone and shortages are creating critical problems.

■ Tinplate users face supply problems all through the first half of 1960.

Right now, canmaker stocks of tinplate are depleted. "Every tinplate customer I've got wants twice the amount I can give him," says one mill salesman. "The can companies started building stocks long ago, but they didn't count on a strike lasting 116 days—or more."

Up, Then Down—Normally, canmakers carry 30- to 45-day inventories. Last winter many began increasing stocks because of the strike threat. Before the strike came in July, they had loaded storage areas. In some cases space was leased in public warehouses to hold tinplate supplies.

Now these large inventories are gone. Still mills are racing to fill orders extending back to last summer. The real pinch will come as canmakers get ready for the spring season.

Heading West—But already problems are cropping up. Some tinplate shipments have been diverted from other locations and sent to California. This is an effort to save crops and other perishables there.

Tinplate mills must compete with other products for supplies of flat-rolled steel. These products include cold-rolled and galvanized sheet which are also in great demand.

This, too, will affect tinplate deliveries in the months ahead.

Sheet and Strip—Customers believe backed-up demand for these products is so widespread they won't get normal deliveries until the second half of 1960. Cold-rolled sheet remains the most critical product. The supply outlook for enameling iron and galvanized sheet is also dark.

Plates—Mills starting up hope to ship all July and August tonnages by early January. September orders should go out late in January or early in February, if there are no new shutdowns. Meanwhile, some users are still waiting for July tonnages. Buyers expect that inventories won't return to normal until mid-1960.

Bar—Mills are pushing to make shipments. But some estimate it will take until the end of January before pre-strike commitments are filled. Cold-finishers in the **Midwest** say only small tonnages will be available for another 45 days.

Pipe and Tubing—Buttweld pipe is the tightest item among pipe mill

PURCHASING AGENT'S CHECKLIST

Standardization can pay big dividends. P. 51

Supplies of oil country goods are scarce because of the strike. But pipe producers are still not encouraged about the long-range sales outlook. P. 54

How to select and buy chains wisely. P. 102

products. Producers are quoting February delivery on new orders. Even on the **East and West Coast**, where imports are plentiful, jobbers say there's a real shortage.

Oil country seamless is sold out through the first quarter of 1960. Beyond that, the outlook is uncertain. (For a full story on the oil country goods market, see p. 54.)

Defense Steel—The government has extended the order asking for special preference from mills on top-priority defense orders. Originally the order expired Dec. 31. Now it has been extended as long as needed. The new amendment, issued Nov. 17, requires steel mills to accept defense orders without regard to lead times and military set-asides.

Wire Products—Mill order books are just about full for the first quarter. Second quarter orders are now coming in. There's strong demand for manufacturer's wire, welding wire, and rod. Even wire fabric is wanted for use in cement pipe reinforcing and other building products.

Fasteners—Russell, Burdsall & Ward Bolt and Nut Co. has moved to further simplify the pricing and terms used in the industrial fastener industry. Last summer the company introduced a new pricing system using product list prices and simplified discounts. (See *The IRON AGE*, July 16, p. 140.)

Now, suggestions from customers and distributors have been added to the new price lists and discounts. Unnecessary fastener terminology has been dropped and other terms made more definite. In addition, "some lists were revised so that they all bear a direct relation to cost." Any price change can be taken care of by changing the discount, RB&W says.

Electrolytic Manganese—Price increases of 1¢ a lb have been made in electrolytic manganese metal by Union Carbide Metals Co., Div. of Union Carbide Corp.

The increase, effective Nov. 10, applies across the board to all grades and to all sizes and quantities.

COMPARISON OF PRICES

(Effective Nov. 23, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Nov. 23 1959	Nov. 17 1959	Oct. 27 1959	Nov. 24 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$10.65	\$10.65	\$10.65	\$10.65
Tin plates, electro (0.50 lb.)	9.85	9.85	9.85	9.85
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	\$80.00	\$80.00	\$80.00	\$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Pig Iron: (per gross ton)

	Nov. 23 1959	Nov. 17 1959	Oct. 27 1959	Nov. 24 1959
Foundry, del'd Phila.	\$70.57	\$70.57	\$70.57	\$70.57
Foundry, Southern Cin'tl	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb½	12.25	12.25	12.25	12.25

Pig Iron Composite: (per gross ton)

Pig iron	\$66.41	\$66.41	\$66.41	\$66.41
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Scrap: (per gross ton)

No. 1 steel, Pittsburgh	\$45.50*	\$47.50	\$47.50	\$43.50
No. 1 steel, Phila. area	44.50*	46.50	46.50	35.50
No. 1 steel, Chicago	42.50*	44.50	44.50	42.50
No. 1 bundles, Detroit	44.50	44.50	40.50	36.50
Low phos., Youngstown	51.50	51.50	48.50	45.50
No. 1 mach'y cast, Pittsburgh	55.50	55.50	55.50	51.50
No. 1 mach'y cast, Phila.	54.50	54.50	53.50	49.50
No. 1 mach'y cast, Chicago	63.50*	64.50	64.50	53.50

Steel Scrap Composite: (per gross ton)

No. 1 hvy. melting scrap	\$44.17*	\$46.17	\$46.17	\$40.50
No. 2 bundles	30.50*	31.83	31.50	29.00

Coke, Connellsville: (per net ton at oven)

Furnace coke, prompt	\$14.50-15.50	\$14.50-15.50	\$14.50-15.50	14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50

Nonferrous Metals: (cents per pound to large buyers)

Copper, electrolytic, Conn.	30-33	30-33	30-31.50	29.00
Copper, Lake, Conn.	33.00	33.00	31.50	29.00
Tin, Straits, N. Y.	100.75†	101.00	101.75	99.25
Zinc, East St. Louis	12.50	12.50	12.5-13	11.50
Lead, St. Louis	12.80	12.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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No Big Orders; Prices Drop

Failure of big buys to materialize as expected resulted in price breaks in some major consuming areas.

Drops in Pittsburgh and Chicago point to weakness. But big buys could reverse downtrend.

■ Price levels, which had been hovering uncertainly in some major markets, were cracked this week.

In Chicago and Pittsburgh, mills were able to buy at lower prices. Tonnages were not especially large, but were sufficient to force prices down.

In Chicago, the first weakness appeared in turnings, and rapidly spread throughout the entire list. In Pittsburgh, the purchases at lower levels forced prices down on open-hearth grades.

There is still some speculation that the first major buys will bring prices back to former levels, or even higher. But, at least for the time, the upward pressure was halted.

A lessening of demand for export hasn't weakened Coastal prices yet.

Pittsburgh—Prices broke downward here as the steel startup failed to produce the expected wave of new orders. The lag has produced a new willingness to sell. A local mill last week bought No. 2 heavy melting at prices of \$37 and \$38, No. 2 bundles at \$33 and \$34. Prices of No. 2 heavy melting were \$2 to \$3 under the last purchase here. There is not enough new trading of No. 1 grades to peg the market but the feeling in scrap cir-

cles was that these could be bought for \$2 under old levels.

Chicago — Scrap prices were forced downward \$1 to \$2 last week as material moved below prices established earlier in the week. The break came in turnings and spread to other grades.

Philadelphia—Prices remain unchanged as no new orders were reported. Large tonnage buys by mills have failed to materialize, but the trade believes that mills are testing dealers by holding back on orders. Some dealers believe lower prices will be offered by mills when they do enter the market. However, dealers say they will resist lower prices.

New York—Steelmaking grades slipped back \$1 as mill buying failed to maintain new levels set last week. Top for No. 1 heavy melting is now \$39 per gross ton. The trade views this dip as a temporary setback, however, and the area's largest broker states he will resume buying in the latter half of this week. Other grades are holding firm, but without sharp boosts yet.

Detroit—The area's largest mill bought a small amount of No. 2 bundles. There are rumors that another large mill is interested in making purchases. But there hasn't been enough trading to determine a market pattern. A few small industrial lists that have come out, however, indicate prices will stay relatively firm.

Cleveland—Lack of a major buy has cooled off the market. But there

is hope that new sales may be made in a week or two after laid-down tonnage is in. Auto lists will probably hold their own or go up a little, but there won't be much offered. Foundry scrap is holding its own.

St. Louis—A little easier tone prevails in the market here. Dealers are showing a little more willingness to sell. Mills are buying at current levels, but turn up their noses at any increase in price. The general feeling is that prices have reached a top, at least temporarily.

Cincinnati—Local yards are expecting a pickup in river shipments from here in a week or so. Secondary grades had been moving well to river points, but there has been a drop off. Meanwhile, local mills aren't anxious to buy and dealers are slow to sell. Foundries are slow because pickup from the steel startup hasn't hit them yet.

Birmingham—Scrap was moving fairly well to foundries this week, but steel mills were out of the market. Consumers are holding the price line and dealers are accepting orders, evidently feeling the market has leveled off at least for the present.

Buffalo—No new activity is reported in the local market and the trade expects prices to remain about where they are for a while. Since the resumption of steelmaking operations, 11 lake boats have entered the port bringing a total of 50,000 tons of scrap from Detroit.

Boston—Prices are unchanged. Mills are staying out of the market and are trying to hold the price line. So far, they are doing it, although the price structure remains firm.

West Coast — Prices remain steady at higher levels. Flow of scrap is very slow. Mills are insisting on quality scrap—or no purchases.

Houston—The district mill remains out of the market and as a result an uneasiness is evident in the trade.



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SCRAP PRICES

(Effective Nov. 23, 1959)

Pittsburgh

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	46.00 to 47.00
No. 1 factory bundles	53.00 to 54.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs plate	55.00 to 56.00
Heavy turnings	38.00 to 39.00
No. 1 RR hvy. melting	51.00 to 52.00
Scrap rails, random lgth.	61.00 to 62.00
Rails 2 ft and under	68.00 to 69.00
RR specialties	60.00 to 61.00
No. 1 machinery cast.	55.00 to 56.00
Cupola cast.	51.00 to 52.00
Heavy breakable cast.	49.00 to 50.00
Stainless	
18-8 bundles and solids	235.00 to 240.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. forge crops	57.00 to 58.00
Low phos. punch'gs plate	
1/2 in. and heavier	54.00 to 55.00
Low phos. 2 ft and under	49.00 to 50.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	58.00 to 59.00
Rerolling rails	65.00 to 66.00
Rails 2 ft. and under	63.00 to 64.00
Angles and splice bars	57.00 to 58.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	54.00 to 55.00
No. 1 machinery cast.	63.00 to 64.00
Cupola cast.	56.00 to 57.00
Cast iron wheels	50.00 to 51.00
Malleable	64.00 to 65.00
Stove plate	51.00 to 52.00
Steel car wheels	55.00 to 56.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	24.00 to 25.00
Mixed bor. short turn.	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	27.00 to 28.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	50.00 to 51.00
Low phos. 2 ft punch'gs	52.00 to 53.00
Elec. furnace bundles	49.00 to 50.00
Heavy turnings	34.00 to 35.00
RR specialties	50.00 to 51.00
Rails 18 in. and under	67.00 to 68.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	47.00 to 48.00
Cast iron car wheels	50.00 to 51.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	54.00 to 55.00

Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. and under	49.00 to 50.00
Rails, random length	56.00 to 57.00
Rails, 18 in. and under	64.00 to 65.00
No. 1 cupola cast.	49.00 to 50.00
Hvy. breakable cast.	44.00 to 45.00
Drop broken cast.	59.00 to 60.00

Youngstown

No. 1 hvy. melting	\$47.00 to \$48.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	31.50 to 32.50
Machine shop turn.	21.50 to 22.50
Shoveling turnings	26.50 to 27.50
Low phos. plate	51.00 to 52.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$43.50 to \$44.50
No. 2 hvy. melting	35.50 to 36.50
No. 1 dealer bundles	43.50 to 44.50
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	46.50 to 47.50
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Cut structural & plates, 2 ft and under	50.00 to 51.00
Drop forge flashings	43.50 to 44.50
Low phos. punch'gs plate	46.50 to 47.50
Foundry steel, 2 ft & under	45.00 to 46.00
No. 1 RR hvy. melting	47.50 to 48.50
Rails 2 ft and under	65.00 to 66.00
Rails 18 in. and under	66.00 to 67.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	60.00 to 61.00
No. 1 machinery cast.	56.00 to 57.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	225.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	39.00 to 40.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	21.00 to 22.00
Low phos. plate	44.00 to 45.00
Structurals and plate, 2 ft and under	45.00 to 46.00
Scrap rails, random lgth.	43.00 to 44.00
Rails 2 ft and under	53.00 to 54.00
No. 1 machinery cast.	53.00 to 54.00
No. 1 cupola cast.	49.00 to 50.00

St. Louis

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	46.50 to 47.50
No. 2 bundles	27.00 to 28.00
Machine shop turn.	21.50 to 22.50
Shoveling turnings	23.50 to 24.50
Cast iron borings	25.00 to 26.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	59.00 to 60.00
Angles and splice bars	50.00 to 51.00
RR specialties	51.50 to 52.50
Cupola cast.	54.00 to 55.00
Heavy breakable cast.	45.00 to 46.00
Stove plate	45.00 to 46.00
Cast iron car wheels	48.50 to 49.50
Rerolling rails	65.00 to 66.00
Unstripped motor blocks	45.00 to 46.00

Birmingham

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	42.00 to 43.00
Elec. furnace, 3 ft & under	40.00 to 41.00
Bar crops and plate	47.00 to 48.00
Structural and plate, 2 ft	46.00 to 47.00
No. 1 RR hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	53.00 to 54.00
Rails, 18 in. and under	56.00 to 57.00
Angles and splice bars	49.00 to 50.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast.	55.00 to 56.00
Stove plate	55.00 to 60.00
Cast iron car wheels	45.00 to 46.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 dealer bundles	23.00 to 24.00
Machine shop turnings	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast.	41.00 to 42.00
Mixed yard cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Stainless	
18-8 prepared solids	200.00 to 205.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	42.00 to 43.00
Drop forge flashings	42.00 to 43.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	23.00 to 24.00
Heavy breakable cast.	41.00 to 42.00
Mixed cupola cast.	48.00 to 49.00
Automotive cast.	54.00 to 55.00
Stainless	
18-8 bundles and solids	205.00 to 210.00
18-8 turnings	80.00 to 85.00
430 bundles and solids	100.00 to 105.00

Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	18.50 to 19.50
No. 1 machinery cast.	41.00 to 42.00
Mixed cupola cast.	39.00 to 40.00
Heavy breakable cast.	35.00 to 36.00

San Francisco

No. 1 hvy. melting	\$40.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	36.00
No. 2 bundles	22.00
Machine shop turn.	\$17.00 to 19.00
Cast iron borings	17.00 to 19.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	\$41.00
No. 2 hvy. melting	39.00
No. 1 dealer bundles	38.00
No. 2 bundles	21.00
Machine shop turn.	\$18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00 to 50.00
No. 1 cupola cast.	47.00 to 48.00

Seattle

No. 1 hvy. melting	\$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	24.00
Mixed steel scrap	24.25
Bush., new fact., prep'd	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	\$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	\$48.00 to 49.00
Unstripped motor blocks	39.50 to 40.50
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	34.00 to 35.00

for the purchase or sale of **scrap**



Luria Brothers and Company, Inc.

main office **CHRYSLER BUILDING EAST, New York, N. Y.**

PLANTS

READING, PENNA. MODENA, PENNA.

BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILLINOIS
CINCINNATI, OHIO

CLEVELAND, OHIO
DETROIT, MICHIGAN
HOUSTON, TEXAS
KOKOMO, INDIANA
LEBANON, PENNA.

LOS ANGELES, CAL.
MEMPHIS, TENN.
NEW YORK, N. Y.
PITTSBURGH, PENNA.
PHILADELPHIA, PA.

PUEBLO, COLORADO
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Kennecott and USW Reach Agreement

Steelworkers "encirclement" tactics accomplish first step with copper.

Aluminum industry may be next. Producers announce a plan of coordinating their negotiations.

■ Kennecott Copper Co. settled the strike by United Steelworkers at its Garfield, U., plant over last week end. It is the closest thing to a breakthrough in the copper strike picture.

The settlement will cost Kennecott 22.3¢ per hour over the next 20 months, expiring July 31, 1961.

Mine, Mill Next—Kennecott immediately slapped an "urgent" label on talks with International Union of Mine, Mill and Smelter Workers. Mine, Mill represents the largest block of workers at Kennecott (and in the industry).

Settlement with this union could be reached before the end of this week. But an unofficial source on the scene of the talks notes some "hurt feelings" in some top Mine, Mill leadership, which could delay things by as much as several weeks.

The fate of the right to manage program that Kennecott had been pressing in talks with Steelworkers is still not clear. The union is claiming complete victory. However, on at least one point it's a matter of language.

The company wanted to close for vacations. Unions were opposed. The men get an extra paid holiday, and the plant will close once during the summer for "repairs."

Imports—With strikes coming to an end, users have apparently weathered the storm. There is still no shortage of copper. Main reason: Huge stocks built up by users. But there was also a sharp turn-about in the flow of metal in and out of the country.

Total imports, including ores and concentrates, blister, and refined metal from January through August, when the strikes started, reached about 40,000 tons. For just the month of September, imports climbed to about 76,000 tons.

Imports of refined copper in September were about 40,000 tons. For the first eight months, the total was only about 9000 tons.

On the other hand, exports of refined copper during the nine months period reached 26,000 tons. Some of the exports might have been metal that entered the country as ore or concentrates. In this case the trend shift is emphasized.

Net Imports—From January through August, about 7000 tons of ore and concentrates were imported. In September alone, the total was over 18,000 tons.

Matching total imports against total exports shows that through August, the U. S. was a net importer by about 22,000 tons. But in September the U. S. was a net importer by 67,000 tons—an increase of more than 300 pct for a single month over the preceding eight months.

Naturally, there has been some speculation about where the price will settle once the domestic industry is producing again. Any

statements now would be sheer guesswork. One sure thing: Prices will tumble sharply from the going rate for prompt metal in the last few weeks of 37¢ to 40¢ per lb.

Aluminum

Aluminum producers will put up a united front when they sit down to their individual bargaining sessions with the Steelworkers late this week, or early next week.

They have announced that they will coordinate their negotiations. This was not completely unexpected. The producers have always kept in close touch with each other during negotiations. And Edgar Kaiser, who was considered the threat to the solid aluminum front, has indicated he never considered breaking this tradition as long as the other producers were willing.

The important thing is that this doesn't threaten the likelihood of settlements as soon as the Steelworkers can clear their decks.

David J. McDonald, Steelworker president would like to "encircle" the steel industry with settlements in other industries.

Tin prices for the week: Nov. 18—101.00; Nov. 19—101.00; Nov. 20—100.875; Nov. 23—100.75*; Nov. 24—100.75*.

*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/59
Aluminum ingot	26.80	26.10	8/1/59
Copper (E)	30-33	30-31.50	11/6/59
Copper (CS)	33.00	30.00	8/1/59
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	12.80	11.80	8/24/59
Lead, N. Y.	13.00	12.00	8/24/59
Magnesium ingot	38.00	34.50	8/13/59
Magnesium pig	35.25	33.75	8/13/59
Nickel	74.00	64.50	12/8/59
Titanium sponge	150-160	162-162	8/1/59
Zinc, E. St. L.	12.50	12.5-13	11/2/59
Zinc, N. Y.	13.00	13-13.5	11/2/59

ALUMINUM: 99% Ingot **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colborne, Canada. **ZINC:** prime western. **TIN:** See above; Other primary prices, pg. 137.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("P" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3
1100, 3008.....	45.7	43.8	42.8	43.3
6062.....	53.1	48.4	46.9	46.0
6061-0.....	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6063 T-6
6-8.....	42.7-44.2	51.1-54.8
12-14.....	42.7-44.2	52.0-56.5
24-26.....	43.2-44.7	52.8-57.5
36-38.....	46.7-49.2	56.9-59.5

Screw Machine Stock—2011-T-3

Size*	3/4	5/8-1/2	1/2-1	1/4-1 1/2
Price.....	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage.....	\$1.411	\$1.884	\$2.353	\$2.833
.024 gage.....	1.782	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓	Gage→	.250 3.00	.250 2.00	.188	.081	.032
AZ31B Stand, Grade.....		67.9	69.0	77.9	103.1	
AZ31B Spec.....		93.3	95.7	108.7	171.3	
Tread Plate.....		70.6	71.7			
Tooling Plate.....	73.0					

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C).....	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B).....	84.6	85.7	90.6	104.3

Alloy Ingot

AZ31B (Die Casting).....	37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)	

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel	Inconel
Sheet, CR.....	138
Strip, CR.....	124
Rod, bar, HR.....	107
Angles, HR.....	107
Plates, HR.....	130
Seamless tube.....	167
Shot, blocks.....	87

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	57.13	.....	54.86	58.32
Brass, Yellow.....	50.57	50.86	50.26	54.23
Brass, Low.....	53.53	53.52	53.22	57.09
Brass, R L.....	54.58	54.87	54.27	58.14
Brass, Naval.....	55.12	.....	48.68	58.78
Muntz Metal.....	53.20	.....	48.26	.....
Comm. Br.....	56.17	56.46	55.86	59.48
Mang. Br.....	58.86	.....	52.21	.....
Phos. Br. 5%.....	77.44	.....	78.19	.....

Free Cutting Brass Rod..... 36.96

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, \$7.25-\$8.50; alloy, \$13.40-\$17.00. Plate, HR, commercially pure, \$5.26-\$6.00; alloy, \$8.00-\$10.00. Wire, rolled and/or drawn, commercially pure, \$5.75-\$6.25; alloy, \$7.75-\$10.00; Bar, HR or forged, commercially pure, \$4.25-\$5.00; alloy, \$4.25-\$7.50; billets, HR, commercially pure, \$5.55-\$4.10; alloy, \$5.55-\$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex., 29.50
Beryllium Aluminum 5% Be, Dollar
per lb contained Be.....\$74.75
Beryllium copper, per lb contained Be.....\$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading.....\$71.50
Bismuth, ton lots.....\$ 2.25
Cadmium, del'd.....\$ 1.40
Calcium, 99.9% small lots.....\$ 4.55
Chromium, 99.8% metallic base.....\$ 1.31
Cobalt, 97-99% (per lb).....\$1.75 to \$1.82
Germanium, per gm, f.o.b. Miami,
Okla., refined.....\$3.30 to 42.00
Gold, U. S. Treas. per troy oz.....\$35.00
Indium, 99.9%, dollars per troy oz.....\$ 2.25
Iridium, dollars per troy oz.....\$75 to \$85
Lithium, 98%.....\$11.00 to \$14.00
Magnesium sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask
f.o.b. New York.....\$216 to \$218
Nickel oxide sinter at Buffalo, N. Y.,
or other U. S. points of entry,
contained nickel..... 69.60
Palladium, dollars per troy oz.....\$20 to \$22
Platinum, dollars per troy oz.....\$77 to \$80
Rhodium.....\$120.00 to \$125.00
Silver ingots (\$ per troy oz).....\$1.375
Thorium, per kg.....\$43.00
Vanadium.....\$ 3.45
Zirconium sponge.....\$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot.....	30.75
No. 115.....	29.25
No. 120.....	28.75
No. 123.....	35.25
80-10-10 ingot.....	33.00
No. 305.....	44.00
No. 315.....	40.75
88-10-2 ingot.....	36.00
No. 210.....	24.75
No. 215.....	24.75
Yellow ingot.....	29.25
No. 405.....	29.25
Manganese bronze No. 421.....	29.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.....	25.00-25.25
0.60 copper max.....	24.75-25.00
Piston alloys (No. 132 type).....	26.75-27.75
No. 13 alum. (No. 2 grade).....	23.50-24.00
108 alloy.....	24.00-24.50
195 alloy.....	26.50-27.50
13 alloy (0.60 copper max.).....	24.75-25.00
AXS-679 (1 pct zinc).....	23.75-24.75

(Effective Nov. 30, 1959)

Steel deoxidizing aluminum notch bar

granulated or shot

Grade 1—95-97 1/2%.....	24.00-25.00
Grade 2—92-95%.....	22.75-23.75
Grade 3—90-92%.....	21.75-22.75
Grade 4—85-90%.....	21.25-22.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	29	28 1/2
Yellow brass.....	22 1/2	20 1/2
Red brass.....	25 1/2	25
Comm. bronze.....	28 1/2	26
Mang. bronze.....	20 1/2	20
Free cutting rod ends.....	21 1/2	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	29
No. 2 copper wire.....	25 1/2
Light copper.....	23 1/2
*Refinery brass.....	23 1/2
Copper bearing material.....	23
*Dry copper content.....	

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	29
No. 2 copper wire.....	25 1/2
Light copper.....	23 1/2
No. 1 composition.....	23
No. 1 comp. turnings.....	22 1/2
Hvy. yellow brass solids.....	16 1/2
Brass pipe.....	16 1/2
Radiators.....	18

Mixed old cast.....	14 — 15
Mixed new clips.....	16 1/2 — 17
Mixed turnings, dry.....	14 1/2 — 15 1/2

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 copper wire.....	25 — 25 1/2
No. 2 copper wire.....	22 — 22 1/2
Light copper.....	20 1/2 — 21
Auto radiators (unsweated).....	14 1/2 — 15
No. 1 composition.....	18 1/2 — 19
No. 1 composition turnings.....	17 — 17 1/2
Cocks and faucets.....	15 — 15 1/2
Clean heavy yellow brass.....	13 — 13 1/2
Brass pipe.....	15 — 15 1/2
New soft brass clippings.....	15 1/2 — 15 3/4
No. 1 brass rod turnings.....	12 1/2 — 13

Aluminum

Alum. pistons and struts.....	7 1/2 — 8
Aluminum crankcase.....	11 1/2 — 11 3/4
1100 (2s) aluminum clippings.....	15 — 15 1/2
Old sheet and utensils.....	11 1/2 — 11 3/4
Borings and turnings.....	7 — 7 1/2
Industrial castings.....	11 1/2 — 11 3/4
2020 (24S) clippings.....	12 1/2 — 13

Zinc

New zinc clippings.....	6 1/2 — 6 3/4
Old zinc.....	4 1/2 — 4 3/4
Zinc routings.....	3 1/2 — 3 3/4
Old die cast scrap.....	2 1/2 — 2 3/4

Nickel and Monel

Pure nickel clippings.....	52-54
Clean nickel turnings.....	40
Nickel anodes.....	52-54
Nickel rod ends.....	52-54
New Monel clippings.....	30-32
Clean Monel turnings.....	20-23
Old sheet Monel.....	26-28
Nickel silver clippings, mixed.....	18
Nickel silver turnings, mixed.....	15

Lead

Soft scrap lead.....	8 3/4 — 9 1/4
Battery plates (dry).....	4 1/2 — 4 3/4
Batteries, acid free.....	2 1/2 — 2 3/4

Miscellaneous

Block tin.....	77 — 78
No. 1 pewter.....	59 — 60
Auto babbitt.....	40 — 41
Mixed common babbitt.....	9 1/2 — 10 1/4
Solder joints.....	14 — 14 1/2
Siphon tops.....	10 1/2 — 10 3/4
Small foundry type.....	10 1/2 — 10 3/4
Monotype.....	9 1/2 — 9 3/4
Lino. and stereotype.....	7 1/2 — 8 1/4
Electrotype.....	6 — 6 1/2
Hand picked type shells.....	2 1/2 — 3 1/4
Lino. and stereo. dross.....	2 1/2 — 3 1/4
Electro dross.....	2 1/2 — 3 1/4

IRON AGE

STEEL
PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS				PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.			\$119.00 B3			5.55 B3	8.10 B3	5.55 B5						
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3		5.55 B3	8.10 B3	5.55 B3	5.10 B3, R3	7.425 S10, R7	7.575 B3			
	Phila., Pa.										7.875 P15				
	Harrison, N. J.														15.55 C11
	Conschocken, Pa.		\$104.50 A2	\$126.00 A2						5.15 A2		7.575 A2			
	New Bedford, Mass.										7.875 R6				
	Johnstown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3			5.55 B3	8.10 B3							
	Boston, Mass.										7.975 T8				
	New Haven, Conn.										7.875 D1				
	Baltimore, Md.										7.425 T8				15.90 T8
	Phoenixville, Pa.						5.55 P2		5.55 P2						
	Sparrows Pt., Md.									5.10 B3		7.575 B3			
MIDDLE WEST	New Britain, Bridgeport, Wallingford, Conn.			\$119.00 N8							7.875 W1, S7				
	Pawtucket, R. I. Worcester, Mass.										7.975 N7, A5				15.90 N7 15.70 T8
	Alton, Ill.									5.30 L1					
	Ashland, Ky.									5.10 A7		7.575 A7			
	Canton-Massillon, Dover, Ohio		\$102.00 R3	\$119.00 R3, \$114.00 T5							7.425 G4		10.80 G4		
	Chicago, Franklin Park, Evanston, Ill.	\$80.00 U1, R3	\$99.50 U1, R3, W8	\$119.00 U1, R3, W8	6.50 U1		5.50 U1, W8, P13	8.05 U1, Y1, W8	5.50 U1	5.10 W8, N4, A1	7.525 A1, T8, M8	7.575 W8		8.40 W8, S9, J3	15.55 A1, S9, G4, T8
	Cleveland, Ohio										7.425 A5, J3		10.75 A5	8.40 J3	
	Detroit, Mich.			\$119.00 R5						5.10 G3, M2	7.425 M2, S1, D1, P11	7.575 G3	10.80 S1		
	Anderson, Ind.										7.425 G4				
	Gary, Ind. Harbor, Indiana	\$80.00 U1	\$99.50 U1	\$119.00 U1, Y1			5.50 U1, J3	8.05 U1, J3	5.50 J3	5.10 U1, J3, Y1	7.425 Y1	7.575 U1, J3, Y1	10.90 Y1	8.40 U1, Y1	
	Sterling, Ill.	\$80.00 N4					5.50 N4	7.75 N4	5.50 N4	5.20 N4					
	Indianapolis, Ind.										7.575 R5				15.70 R5
	Newport, Ky.									5.10 A9				8.40 A9	
WEST	Niles, Warren, Ohio Sharon, Pa.		\$99.50 S1, C10	\$119.00 C10, S1						5.10 R3, S1	7.425 R3, T4, S1	7.575 R3, S1	10.80 R3, S1	8.40 S1	15.55 S1
	Owensboro, Ky.	\$80.00 G5	\$99.50 G5	\$119.00 G5											
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 U1, P6	\$99.50 U1, C11, P6	\$119.00 U1, C11, B7	6.50 U1		5.50 U1, J3	8.05 U1, J3	5.50 U1	5.10 P6	7.425 J3, B4 7.525 E3			8.40 S9	15.55 S9
	Weirton, Wheeling, Follansbee, W. Va.				6.50 U1, W3		5.50 W3		5.50 W3	5.10 W3	7.425 W5	7.575 W3	10.80 W3		
	Youngstown, Ohio	\$80.00 R3	\$99.50 Y1, C10	\$119.00 Y1				8.05 Y1		5.10 U	7.425 Y1, R5	7.575 U1, Y1	10.95 Y1	8.40 U1, Y1	15.55 R5, Y1
	Fontana, Cal.	\$90.50 K1	\$109.00 K1	\$140.00 K1			6.30 K1	8.85 K1	6.45 K1	5.825 K1	9.20 K1				
	Geneva, Utah		\$99.50 C7				5.50 C7	8.05 C7							
	Kansas City, Mo.						5.60 S2	8.15 S2						8.65 S2	
	Los Angeles, Torrance, Cal.		\$109.00 B2	\$139.00 B2			6.20 C7, B2	8.75 B2		5.85 C7, B2	9.30 C7, R5			9.60 B2	17.75 J3
	Minnequa, Colo.						5.80 C6			6.20 C6	9.375 C6				
	Portland, Ore.						6.25 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$109.00 B2				6.15 B2	8.70 B2		5.85 C7, B2					
	Seattle, Wash.		\$109.00 B2				6.25 B2	8.80 B2		6.10 B2					
SOUTH	Atlanta, Ga.						5.70 A8			5.10 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 T2	\$99.50 T2				5.50 T2 R3, C16	8.65 T2		5.10 T2, R3, C16		7.575 T2			
	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 S2			5.60 S2	8.15 S2						8.65 S2	

(Effective Nov. 20, 1959)

IRON AGE

STEEL
PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE †		Holloware Enameling 29 ga.		
		Hot-rolled 18 ga. & heavy	Cold- rolled	Galvanized (Hot-dipped)	Enamel- ing	Long Tonne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box			
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mfg. terms deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00- lb. add \$1.00. Differential 1.00 lb./0.25 lb. add 65¢.			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	5.15 A2	6.325 A2				7.575 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.									6.40 B3				
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.325 U1				\$10.50 U1	\$9.20 U1	
	New Haven, Conn.													
	Phoenixville, Pa.													
MIDDLE WEST	Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.40 B3	\$9.10 B3		
	Worcester, Mass.									6.70 A5				
	Trenton, N. J.													
	Alton, Ill.									6.60 L1				
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7							
	Canton-Massillon, Dover, Ohio			6.875 R1, R3										
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8				
	Sterling, Ill.									6.50 N4, K2				
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5				
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3						
WEST	Newport, Ky.	5.10 A9	6.275 A9											
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.40 U1, Y1	\$9.10 I3, U1, Y1	7.85 U1, Y1	
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2								\$9.20 G2	7.95 G2	
	Kokomo, Ind.			6.975 C9						6.50 C9				
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2								
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7								
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, S1	6.275 R3	6.875 R3 7.65 R3*	6.775 S1	7.225 S1*, R3	7.525 R3, S1	9.275 R3,			\$9.10 R3			
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3 7.50 E3*	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.40 U1, J3	\$9.10 U1, J3	7.85 U1, J3	
	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7				
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.40 W5, W3	\$9.10 W5, W3	7.85 W5	
SOUTH	Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1				
	Fontana, Cal.	5.825 K1	7.40 K1				8.25 K1	10.40 K1			\$11.05 K1	\$9.75 K1		
	Geneva, Utah	5.20 C7												
	Kansas City, Mo.									6.65 S2				
	Los Angeles, Torrance, Cal.									7.20 B2				
	Minneapolis, Colo.									6.65 C6				
	San Francisco, Niles, Pittsburg, Cal.	5.00 C7	7.225 C7	7.625 C7						7.20 C7	\$11.05 C7	\$9.75 C7		
	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.50 T2	\$9.20 T2		
	Houston, Texas									6.65 S2				

* Electrogalvanized sheets.

(Effective Nov. 20, 1959)

*7.425 at Sharon-Niles is 7.325

IRON AGE

Figures identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES

BARS

PLATES

WIRE

STEEL PRICES		Carbon† Steel	Reinforc- ing	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Consabockan, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.375 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Roadville, Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
MIDDLE WEST	Alton, Ill.	5.875 L1										8.20 L1
	Ashland,Newport,Ky.							5.30 A7,A9		7.50 A9	7.95 A7	
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5		5.30 E2				
	Chicago, Joliet, Waukegan, Madison,Harvey,Ill.	5.675 U1,R3, W8,N4,P13	5.675 U1,R3, N4,P13,W8 5.875L1	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
	Cleveland, Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
	Granite City, Ill.							5.40 G2				
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10	9.025 C10		5.30 R3,S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1,J3	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
	Portsmouth, Ohio											8.00 P7
Weirton, Wheeling, Follansbee, W. Va.							5.30 W5					
Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1	
WEST	Emeryville, Fontana, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		9.00 K1	6.10 K1		8.30 K1	8.75 K1	
	Geneva, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	9.00 B2					8.95 B2
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 O2	6.425 O2									
	San Francisco, Niles, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				9.05 B2					8.95 C7,C6
	Seattle, Wash.	6.425 B2,N6, A10	6.425 B2,A10				9.05 B2	6.20 B2		8.40 B2	8.85 B2	
SOUTH	Atlanta, Ga.	5.875 A8	5.675 A8									8.00 A8
	Fairfield City, Ala. Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C16			8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 35¢ higher.

(Effective Nov. 20, 1959)

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conahocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Arnco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
C1 Calstar Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thornsdale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B. Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.
K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Lackde Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Chicago, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.

P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.
R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebbing Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pt) f.a.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD																SEAMLESS							
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2 in.		3 in.		3 1/2 in.		4 in.		4 1/2 in.		5 in.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
Sparrows Pt. B3	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	12.25	*2.25	13.75	*2.50	14.25	*2.75	14.75	*2.50	15.25	*2.75
Youngstown R3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Fontana K1	*10.75	*25.00	*17.75	*22.00	*4.25	*11.50	*17.75	*16.75	*11.25	*15.75	*9.75	*15.25	0.75	*15.50	12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50	12.25	*27.25
Pittsburgh J3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Alton, Ill. L1	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	12.25	*2.25	13.75	*2.50	14.25	*2.75	14.75	*2.50	15.25	*2.75
Sharon M3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Fairless N2	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	12.25	*2.25	13.75	*2.50	14.25	*2.75	14.75	*2.50	15.25	*2.75
Pittsburgh N1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Wheeling W5	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Wheatland W4	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Youngstown Y1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
Indiana Harbor Y1	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50	13.25	*2.25	14.75	*2.50	15.25	*2.25	16.75	*2.50	17.25	*2.25
Lorain N2	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	14.25	*2.25	15.75	*2.50	16.25	*2.25	17.75	*2.50	18.25	*2.25
EXTRA STRONG PLAIN ENDS																								
Sparrows Pt. B3	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	14.25	*0.75	14.75	*1.00	15.25	*0.75	15.75	*1.00	16.25	*1.25
Youngstown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	14.25	*0.75	14.75	*1.00	15.25	*0.75	15.75	*1.00	16.25	*1.25
Fontana K1	*6.25	*22.25	*17.75	*12.25	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75	1.25	1.75
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	14.25	*0.75	14.75	*1.00	15.25	*0.75	15.75	*1.00	16.25	*1.25
Sharon M3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Wheeling W5	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Youngstown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	0.50	15.25	1.00	15.75	1.25	16.25	1.50	16.75	1.75	17.25	2.00
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	16.25	1.00	16.75	1.25	17.25	1.50	17.75	1.75	18.25	2.00

Threads only, butt weld and seamless, 2 1/2 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.50¢ per lb.

(Effective Nov. 20, 1959)

THI

**THOMSON TAKES EXTRA
PAINS TO PREVENT
FASTENING HEADACHES!**

Statistical quality control
procedures plus 100%
inspection give double
assurance of close adherence
to specified rivet dimensions
and positive protection
against interrupted production.



YOU GET PRECISION FASTENING AT MASS PRODUCTION COSTS...

... when Thomson becomes your fastening partner.

In the Thomson line of more than 8,000 rivet designs, you'll find the semi-tubular, deep-drilled, bifurcated (split), shouldered or compression rivet that will give you the best strength-cost ratio in the fastening field. Produced to the industry's highest quality standards at production rates exceeding 20,000,000 rivets a day, these low-cost fasteners merit serious consideration in your product-improvement and cost-reduction programs.

Our leadership in solving fastening problems with quality rivets and precision rivet-setting machines since 1885 is at your service. What is your problem?

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JUDSON L.

THOMSON

MFG. CO., WALTHAM 54, MASS.

Rivets and Rivet-Setting Machines

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Boas.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	69.50	.....
Birmingham R3	62.00	62.50*	63.00	63.50	.....
Birmingham W9	62.00	62.50*	63.00	63.50	.....
Buffalo R3	66.00	66.50	67.00	67.50	.....
Buffalo H1	66.00	66.50	67.00	67.50	.....
Buffalo W6	66.00	66.50	67.00	67.50	.....
Chasler P2	68.00	68.50	69.00	69.50	.....
Chicago J4	66.00	66.50	67.00	67.50	.....
Cleveland A5	66.00	66.50	67.00	67.50	.....
Cleveland R3	66.00	66.50	67.00	67.50	.....
Duluth J4	66.00	66.50	67.00	67.50	71.00†
Erie J4	66.00	66.50	67.00	67.50	71.00†
Everett M6	67.50	68.00	68.50	69.00	.....
Fontana K7	75.00	75.50	76.00	76.50	.....
Ganara, Utah C7	66.00	66.50	67.00	67.50	.....
Granite City C2	67.90	68.40	68.90	69.40	.....
Hubbard Y1	.....	.....	68.50	69.00	.....
Ironton, Utah C7	66.00	66.50	67.00	67.50	.....
Midland C11	66.00	66.50	67.00	67.50	.....
Minneapolis C6	68.00	68.50	69.00	69.50	.....
Monessen P6	66.00	66.50	67.00	67.50	.....
Neville Is. P4	66.00	66.50	67.00	67.50	71.00†
N. Tonawanda T1	66.00	66.50	67.00	67.50	.....
Sharpsville S3	66.00	66.50	67.00	67.50	.....
Sa. Chicago R3	66.00	66.50	67.00	67.50	.....
Sa. Chicago W9	66.00	66.50	67.00	67.50	.....
Swedeland A2	68.00	68.50	69.00	69.50	.....
Toledo J4	66.00	66.50	67.00	67.50	.....
Troy, N. Y. R3	68.00	68.50	69.00	69.50	73.00
Youngstown Y1	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

Silvery iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, J4 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Kookuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Base: silvery pig iron (under 10 pct phos.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, re-roll	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.80	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	46.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	86.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Slabs: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2; Louisville, O., R5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Detroit, S1; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, R3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); Seymour, Conn., S3, (25¢ per lb. higher); New Bedford, Mass., R6 Gary, U1, (25¢ per lb. higher); Baltimore, Md., El (300 series only).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3, R3; Ft. Wayne, J4; Detroit, R5; Gary, U1; Owensboro, Ky., G3; Bridgeport, Conn., N8; Ambridge, Pa., B7.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Newark, N. J., D2; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5; Reading, Pa., C2; Bridgeport, Conn., N8.

Structural: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Ambridge, Pa., B7; Baltimore, El; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C13; Vandergrift, Pa., U1; Gary, U1.

Forging billets: Ambridge, Pa., B7; Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G3; Bridgeport, Conn., N8; Reading, Pa., C2.

(Effective Nov. 20, 1959)

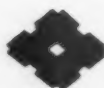


An Important Message For The Man Who Buys STEEL WIRE RODS

Any manufacturer of nails, wire mesh or barbed wire looks first for quality in steel wire rods. For unless the rods are uniform in size and of the specified tensile strength, they're difficult to process and the result is an inferior product. That's why nail mill owners have learned to rely on Sumitomo's wire rods made in accordance with strictest standards.

To keep up with this export demand, Sumitomo Metal has added to its present facilities another modern new wire rod mill, completely equipped with the newest, most modern machinery available.

LEADING PRODUCERS OF STEEL WIRE RODS,
PIPE AND ROLLING STOCK PARTS



SUMITOMO METAL INDUSTRIES, LTD.

Head Office: Osaka, Japan Cable Address: "SUMITOMOMETAL OSAKA"

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.			
0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si.	37.25		
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si			28.25
0.025% C (Simplex)			36.75
5-7% C, 61-65% Cr, 5-8% Si			22.00
5% max C, 50-55% Cr, 2% max Si.			25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/2" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.)			
Carloads, delivered, lump, 3-in. x down, packed.			
Price is sum of contained Cr and contained Si.			
	Cr	Si	
Carloads, bulk	28.25	14.60	
Ton lots	33.50	16.05	
Less ton lots	35.10	17.70	

Calcium-Silicon

Per lb of alloy, lump, delivered, packed.	
30-33% Cr, 60-65% Si, 3.00 max. Fe.	24.00
Carloads, bulk	27.95
Less ton lots	29.45

Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed.	
14-20% Ca, 14-18% Mn, 53-59% Si.	23.00
Carloads, bulk	26.15
Ton lots	27.15
Less ton lots	

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots	\$1.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese Silicon	
16 to 19%	3% max. \$100.50
19 to 21%	3% max. 102.50
21 to 23%	3% max. 105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn	
	25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk)			
P 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.80
Ton lots, packed	14.45
Carloads, bulk, delivered, per lb of briquet	15.10
Briquets, packed pallets, 2000 lb up to carloads	17.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area.	
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.		
	Ton lots	Carloads
98.25% Si, 0.50% Fe.	24.95	22.00
98% Si, 1.0% Fe	24.45	21.50

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.			
50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....		20.00

Ferrovandium

50-55% V delivered, per pound, contained V, in any quantity.	
Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.			
	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
100 to 1999 lb.	2.40	3.30	4.55

(Effective Nov. 20, 1959)

Alisfer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.50
--	--------

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots	\$3.45
Less ton lots	3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta

	\$3.40
--	--------

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.

	\$1.76
--	--------

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton

10 tons to less carload	\$120.00
	\$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.35
--	--------

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

	\$255.00
--	----------

Ferrotungsten, 1/2 x down packed, per pounds contained W, ton lots delivered

	\$2.15 (nominal)
--	------------------

Molybdenic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.

bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.49
	\$1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V₂O₅ per pound contained V₂O₅

	\$1.38
--	--------

Zirconium silicon, per lb of alloy 35-40% del'd carloads, bulk

12-15% del'd lump, bulk-carloads	\$26.25¢
	9.25¢

Boron Agents

Borasil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	
2000 lb carload	\$5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound

	30¢
--	-----

Corbortum, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	18.25¢
--------------------	--------

Ferroboreon, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up	
10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grinnal, f.o.b. Cambridge, O., freight allowed, 100 lb and over

No. 1	\$1.05
No. 79	80¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Si, 0.50% max. Al, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	\$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots

	2.15
--	------

RAILWAY EQUIPMENT FOR SALE

Used "As Is" and Reconditioned

RAILWAY CARS All Types

SERVICE-TESTED FREIGHT CAR REPAIR PARTS

For All Types of Cars

3—DIESEL-ELECTRIC LOCOMOTIVES

General Electric
44-Ton Standard Gauge
In ICC Operating Condition

10 Covered Hopper Cars
70-Ton Capacity, Standard Gauge

RAILROAD TRACK SCALE 125 Ton, 52'6", Buffalo

RAILWAY TANK CARS
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6,000- 8,000- and 10,000-Gallon
Cleaned and Tested

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- (1)—2200-HP Whse. Motor, 600-V.D.C., 92/132 R.P.M., enclosed, F.Vent.
- (4)—700-HP Whse. Motors, 250-V.D.C., 300/700 R.P.M., enclosed, F.Vent.
- (2)—445-HP S.S. Motors, 300-V.D.C., 1000 R.P.M., enclosed, F.Vent.
- (2)—600-HP Allis-Chalmers Motor, 600-V.D.C., 300/600 R.P.M., mill type.

We can supply suitable Motor Generator Sets with any of the above.

- (1)—1875 K.W. Whse. motor generator set 250 V.D.C. with 2700 HP., motor 13800/6900 V. and control.

- (1)—2500-HP. 2% R.P.M. Allis-Chalmers slip ring motor, 2200-V., 3 ph., 60 cy.
- (1)—1800-HP. 252 R.P.M. Whse. slip ring motor, 2300-V., 3 ph., 60 cy.
- (3)—1500-HP. 444 R.P.M. General Electric slip ring motors, 6600/4160-V., 3 ph., 60 cy.

★ ★ ★ ★ ★ ★ ★ ★

- (1)—1250-KVA Whse. Hi-Cycle Frequency Set, 800-V., 960 cycle with 1875-HP syn. motor, 2300-V., 3 ph., 60 cy. with all switchgear.

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THE CLEARING HOUSE

West Coast Market Holds Up Well

Used machine dealers on the West Coast say sales were good even through the steel strike.

Business in most areas is high above 1958 levels, and 1960 is predicted to be even bigger.

■ Don't look for a fast post-strike pickup in West Coast used machinery business. Coast dealers and customers haven't lost their optimism—it's just that the strike didn't hurt the West Coast as much as other regions.

"Things never got too bad," reports a leading southern California dealer. "Steel users had metal to work. Small mills there kept going. And there was a good supply of imported steel. So used machinery dealers held their own," he explains.

It was mostly smaller steel-using firms that dragged their feet. Squeezed for material, they were afraid to spend for equipment.

Firm Line—Los Angeles-area dealers say prices are holding a firm line. And their inventories are adequate. Only late-model mills and lathes are hard to find. They're going at near-new prices, just too expensive for used machinery buyers.

Big machines recently sold: 60-in. lathe; 4-in. pipe bender; large welders. Small tub sanders and surface grinders move well.

High Spirits—Morale is quite good among northern California dealers. Inquiries are brisk—though

fewer become orders than is normal, dealers report.

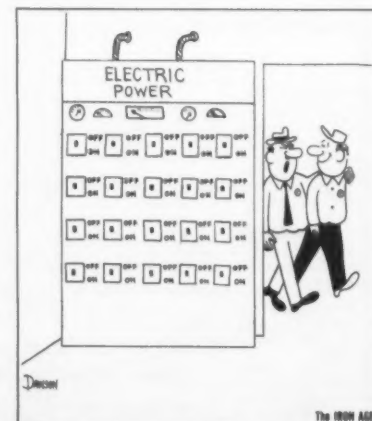
Sales for the first nine months of this year are up from 40 pct to 70 pct over last year. One dealer, whose current sales are running 70 pct ahead of 1958, predicts a "big upsurge" for 1960.

Fabricating equipment—rolls, shears, presses, brakes—move best. Tracer lathes and radial drills don't hang around long either.

Despite tight money, financing presents no problem.

There's no general price boost in the northern California market. The overall picture is one of firmness with rises expected.

Seattle Report—Seattle, too, held up well during the steel strike. By the time of the Taft-Hartley injunction, industry there had almost run out of steel. But there were few actual cutbacks.



It's a simple job, Richards, but it calls for snap decisions.

CO
BEND
Wall
BEND
10' x
13' x
20' x
32' x
BORIN
Cind
BRAK
90 to
CRAN
50
10
10
10
15
15
15
15
15
30
40
120
120
DRAW
7.00
10.00
30.00
35.00
DRILL
6'-
FLAN
FORG
1" to
FURN
15 to
Co

Conf
Liquid

10

Full

H
108

CONSIDER GOOD USED EQUIPMENT FIRST

BENDER

Wallace 500—4% Bender, with Hydr. Mandrel Ex-tractor Unit—NEW

BENDING ROLLS

10' x 10 Ga. Bertsch Initial Type
13' x 3/16" Bertsch Initial Type—New 1957
20' x 1/2" Niles Pyramid Type
32' x 3/4" Baldwin Pyramid Type—New 1942

BORING MILL

Cinn.-Gilbert Horiz. 4 1/2" dia. Spindle

BRAKE—PRESS TYPE

90 ton Niagara, Model 90-8-10

CRANES—OVERHEAD ELECTRIC TRAVELING

5-ton P&H	56' 8"	Span 220/3/60 A.C.
10 ton P&H	55'	Span 230/3/60
10 ton P&H	39'	Span 230 Volt D.C.
10 ton Shaw	120'	Span 230 Volt D.C.
15 ton Shepard Niles	36' 6"	Span 220/3/60 A.C.
15 ton Shepard Niles	37' 9"	Span 220/3/60 A.C.
15 ton Milwaukee	56'	Span 440/3/60 A.C.
15 ton Shepard Niles	55' 6"	Span 220/3/60
30 ton Shaw	70'	Span 230 Volt D.C.
40 ton P&H	75'	Span 440/3/60 A.C.
120 ton Niles	67'	Span 230 Volt D.C.
120 ton Shepard Niles	77'	Span 220/3/60 A.C.

DRAW BENCHES

7,000 lb. Draw Bench, 51 ft. Draw
10,000 lb. Draw Bench, 50 ft. Draw
30,000 lb. Draw Bench, 41 ft. Draw
35,000 lb. Draw Bench, 41 ft. Draw

DRILL—RADIAL

6'-17" Col. American

FLANGING MACHINE

3/4" Blue Valley No. 4

FORGING MACHINES

1" to 5" Acme, Alex. National

FURNACE—MELTING

15 ton Electric Melting Furnace Top Charge—LATE
Complete with transformer

HAMMERS—BOARD DROP—STEAM DROP—STEAM

FORGING 800 lb. to 12,000 lb. Incl.

LATHES

24" x 23' Monarch
36" x 30' American

LEVELERS—ROLLERS

24 Torrington 9 Rolls 8 Dia.
60" Guide 17 Rolls 4 1/2" Dia.

NIBBLER

Fullmax Model 2, Capacity 11/32"

PRESSES—HYDRAULIC

300 ton Southwark Platen 28" x 28", Stroke 25"
400 ton Baldwin Southwark Horiz. Automatic Revers-
ing Hydr. Press, 24" Stroke, 38 1/2" Bet. Columns
500 ton Watson Stillman Piercing Press, 48" x 72"
500 ton IFPM, 14" Stroke, 28" x 38" Bed
1000 ton Southwark Bed 44" x 54", Stroke 20"
Model F-1200-42 Clearing, 30" Stroke, 42x42" Bed
4500 ton B-L-H Bed 68" x 68", Stroke 40"

PUNCH & SHEAR COMBINATIONS

2 1/2" Buffalo Ironworker
Coper & Notcher, Punch 1" x 1/2", Shear, 2 1/2" Rd. 2" Sq.

ROLLS—FORMING

8 Stand, Tishken 7 1/2" C to C of rolls Spindle 2 1/2" Dia.
7 Stand Yoder, 36" Roll Space, 3" Dia. Spindle

14 Stand Tishken, 34" Roll Space, 2 1/2" Dia. Spindle

ROLL FORMING MACHINE TOOLING

Metal Floor & Roof Deck Forming Rolls—NEW. For
any standard machine with 3" or 3 1/2" spindle

ROLLING MILLS

Treadwell Ring Rolling Mill for 7" wide strip
10" x 10" Single Stand Two High
10" x 14" Single Stand Two High
13" x 16" Single Stand Two High
13" x 24" Two Stand Two High
26" x 40" Single Stand Two High
20" x 28" Single Stand Two High
12" x 32" Birdsboro 3-HI Bar Mill
22" x 40" Lewis 3-HI Sheet Mill

ROLLS—PLATE STRAIGHTENING

72" McKay 9 Rolls 15" Dia. Backed-up
90" McKay 9 Rolls 15" Dia. Backed-up

SCRAP CHOPPER

#2 Yoder, 4" Lawn Mower Rotary Type Scrap Chopper

SHEAR—GATE

8' x 1" Wood Hydraulic
8' x 1/2" Beatty No. 29

SHEARS, MISC.

60" x 10 Ga. Cut-off Line
84" x 16" United Up-Cut, 50 H.P. A.C. Motor Drive

SHEARS—ROTARY

No. 23A Quickwork Whiting 3/16 Capacity
No. 40A Quickwork Whiting 1/4" Capacity

SHEARS—SQUARING

6' x 14 Ga. Edwards, Motor Drive—LATE
10' x 1/2" Cincinnati
12' x 1/2" Lodge & Shipley
10' x 1/2" Niagara No. 910

SLITTERS

36" Waterbury Farrel, Slitting Line, Arbor 4 1/2" Dia.

STRAIGHTENER

Torrington #1734 12 Roll. Cap. 1 1/2" Rd., 1-9/16"
80", etc.

SWAGING MACHINE

#6 1/4" Fenn 2-Die Capacity 3 1/2" Tube, 1 1/2" Solid
10" Die Length, Hydraulic Feed

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20,000 & 60,000 # Universal Hydraulic
50,000, 100,000, 200,000 # Univ. Beam Type

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Yoder Induction Tube Mill, Capy 2" to 8", LATE

TUBE REDUCER

1 1/2" Standard

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100 All Steel Twin Hopper Cars

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2 USED I BEAMS

93' 8" long, 36" deep
Flange 1' 4" wide
Approximate Weight
Each Beam—30,700 lbs.

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Because of Mill Consolidation

3 LEE WILSON RECTANGULAR BELL-TYPE ANNEALING FURNACES

atmosphere-controlled with 9 bases, are avail-
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lent when used for manufacture of steel coils,
they have a capacity of 50 tons per charge.
These top-grade furnaces are still set up in the
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prompt sale.

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1—3" Rd. Cap. Open End Vertical
Bar Shear

1—2 3/4" Cap. Buffalo Billet Shear

1—5-Roll Abramson Tube Straight-
ener 3/4" to 3" O.D. Tube

ALBERT CURRY & COMPANY, INC.

#2 GATEWAY CENTER, PITTSBURGH 22, PA.

Eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

TOOL & CUTTER GRINDERS

No. 91A Covell Universal, m.d.
Pratt & Whitney Deep Hole Drill Sharpener,
m.d.
No. 1 Heald Tool Sharpener, m.d.
No. 2A Wm. Sellers Universal Tool Grinder,
m.d.
No. 2B Sellers Wet Drill Grinder, m.d.
No. 4T Sellers Tool, m.d., latest
No. 5T Sellers, m.d.
No. 6G Sellers, m.d.
12" Gleason Spiral Bevel, Gear Cutter Sharpener,
m.d.
No. 13 Gleason Cutter Sharpener, m.d., late
No. 13 Brown & Sharpe Universal, m.d.
No. 4-4 Barber-Colman Hob Sharpener, m.d.
Sundstrand Tool Grinder, m.d.
12x28" Landis Universal & Tool Grinder, m.d.

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20 x 25" Jones & Lamson Fay Automatic Lathe,
1944
No. 3 Lodge & Shipley Duomatic, m.d., late
type

No. 3A Lodge & Shipley Duomatic, m.d.
No. 4 R. K. LeBlond Boring Lathe, 37" bed,
4" hole, m.d., latest
No. 9, 12 LeBlond Multi-Cut, m.d.
No. 12 Gisholt Auto. Prod., m.d.
No. 16 LeBlond Automatic, m.d.
4 x 60" LoSwing, m.d.
11 x 18" LeBlond Rapid Production, m.d.
12 x 18" Reid Small Piece Production, Model
6WSL, m.d.
Model U, 14" x 24" centers LoSwing, m.d.
No. 9WSL, Reid Production, m.d.
17" x 75 1/2" LeBlond, m.d.
No. 10 Sundstrand Automatic Production, m.d.
No. 12 Sundstrand Automatic Production, m.d.
14" x 21" centers Model LS Semi-Automatic Lo-
Swing, m.d.
Lipe Semi-Automatic Carbo Lathe, m.d.
Colburn Mfg. Bench Type Speed Lathe, m.d.
Model NA2B Schauer Speed Lathe
10x20" centers Hi-Turn, new
12" x 12" centers Model 5T Monarch Mfg. Lathe,
m.d.

HAND MILLERS

No. 1M Kent-Owens, m.d., late

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1—AUTOMATIC COOLING BED FOR BARS up to 2" dia. consists of run-in table, cascade section, shuffle bar section, run-out table, with all electric, 200 ft. long.

1—32" x 28" x 110" PLATE MILL, 3-high.

1—28" x 40" HOT STRIP MILL, 2-high reversing, with 2500 HP D.C., motor generator, etc.

1—25" x 42" x 66" HOT STRIP MILL, 4-high.

1—24" x 38" 2-HIGH MILL driven by 400 HP motor, 4600/3/90.

1—22" x 36" 2-HIGH MILL driven by 600 HP motor, 4600/3/90.

1—2 1/2" x 8" x 8" COLD STRIP MILL, 4-high.

1—8" x 10" COLD MILL including uncoiler.

2—28" 3-HIGH ROLL STANDS.

1—New 16" BAR MILL, one 3-high roll stand, pinion stand.

1—New 12" BAR MILL, four 3-high roll stands, pinion stand.

1—INDUCTION WELD TUBE MILL, 2" to 8" dia., new 1954.

1—12" MERCHANT BAR MILL with 16" roughing mill and heating furnace.

1—9" BAR MILL, 3-high.

2—MORGAN TRAVELING TILTING TABLES for 24" 3-high bar mill.

1—34" x 192" ROLL GRINDER.

2—65-TON ELECTRIC MELTING FURNACES, TOP CHARGE, with all electrical and mechanical equipment, including 15,000 KVA and 15,533 KVA transformers.

1—New top-charge ELECTRIC MELTING FURNACE with 2000 KVA transformer, 13,200 volts, 3 phase, 60 cycle.

1—72 PLATE PROCESSING & SHEARING LINE, with tables, transfers, and cut and rotary side trimming shears, scales and pilers. Modern, little used.

1—SHEET POLISHING MACHINE. Capacity 48" x 144".

1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 36" dia. rolls.

1—OPEN HEARTH CHARGING MACHINE, 5 ton capacity 11' track gauge.

1—MAGNETIC SEPARATOR double pulleys, Stearns.

1—SIDE TRIMMER. Strains, maximum width 48" makes 2 cuts 3/16" mild steel.

1—SCRAP BALLER, max. size scrap roll 24" O.D. x 24" long.

1—HALLDEN STRAIGHTENING and cutting-off machine, capacity .562" brass rod.

1—PINTER for tube 2" O.D. x 1/4" wall maximum.

3—CRANE TONGS for coils, automatic, 30,000 lbs. capacity.

1—1200 HP GEAR DRIVE, 353 to 94.5 RPM 3.73 to 1 ratio.

1—3500 HP MOTOR, 11000/6000 volts, 3 phase, 60 cycle, 514 RPM, synchronous, never used.

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MACHINE TOOLS IN STOCK
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- 1—GENERAL ELECTRIC 125 ton, 1000 H.P. New 1940
- 1—PLYMOUTH 45 ton, 360 H.P. New 1942
- 2—WHITCOMB 45 ton, 380 H.P. New 1945
- 10—BALDWIN-WESTINGHOUSE DIESEL LOCOMOTIVES
140 ton, 750 H.P. New 1941

- 1—WHITING OVERHEAD CRANE
90 ton, 56'6" span
- 1—OVERHEAD CRANE 20 ton, 98'10" span

All in Excellent Operating Condition

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CHICAGO 4, ILLINOIS

GUARANTEED—RE-NU-BILT Electric Power Equipment—A. C. Motors 3 phase—60 cycle

SLIP RING					
Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	800	Whse.	CW	550	1776
1	700	A.C.	MT-412	2300	500
1	600	Whse.	CW-4-32D-15	440	1778
1	500	G.E.	MT-412	2300	439
1	500	Whse.	CW	550	350
1	300	G.E.	MT-P-561	2200	1800
1	200	G.E.	IM	440/2200	589
1	125	G.E.	MT-537	220/440	1200
1	100	G.E.	MT-504	440/2200	450
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Cr. Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	227
1	250	G.E.	IE-13B	220	1800
1	200	Whse.	CW-800	2300	1775
1	200	G.E.	IM-17A	2200	435
1	100	A.C.		440	695

SQUIRREL CAGE					
Qu.	H.P.	Make	Type	Volts	Speed
1	800	G.E.	KT-573	2300	1180
1	500	G.E.	PT-559 AY	2300	3600
2	500	Whse.	CS-1115	2300	863/445
4	500	Whse.	CS-1216	2300	500
2	450	El.	F-3810	2200	1200
1	400	Whse.	CS-7151	6600/4000	3585
1	300	Whse.	CS-1002	2300/440	600
1	250	Whse.	CS-8758	2300	1775
1	200	Whse.	CS-5818	440	5450
2	200	Whse.	CS-8558		
1	125	G.E.	D.P.	220/440	1750
1	100	G.E.	FT-558	2300	875
1	100	Whse.	CS	440	380
1	125	Whse.	CS-704C	220/440	1160
2	100	Whse.	CS-760C	2200/440	1100
1	100	Whse.	B.B.CS-607	220/440	1750

SYNCHRONOUS					
Qu.	H.P.	Make	Type	Volts	Speed
1	6000	G.E.	ATI 8		
1	3500	G.E.	P.F.	2200/6600	600
1	1750	G.E.	TS 1.0	4600/2300/4000	360
1	2000	G.E.	ATI	2300	900
2	1750	G.E.	ATI	2300	3600
1	1750	G.E.	TS	2300/4600	900
1	700	G.E.	TS 8P.F.	2300	1200
1	350	Whse.	1.0P.F.	440	900
2	350	G.E.	ATI 1.0P.F.	2300	150
1	325	G.E.	ATI 1.0P.F.	140	1800
2	300	El Mach.	BRKT	2200	1200

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47 Howell Street, Jersey City 6, N. J.
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HAMMERS STEAM DROP

(2) MODEL E CHAMBERSBURG
2,000# Capacity

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KUTZTOWN *Skill* creates FLAT INVERT VENTURI TUBE



The three sections shown here make up a flat Invert Venturi Meter Tube. As may be noted in the photograph, the diameters of the inlet and outlet sections vary, but the bottom remains on a level plane. Tricky? Maybe! Our craftsmen made the inlet and outlet sections by the art of Loam Molding. The center section or throat was made in a dry sand mold. The three castings weighed a total of 17,800 lbs. The laying length of them was 22 feet 1 1/2". We did all machine work and testing to the specification of our customer—B-I-F Industries, Inc.

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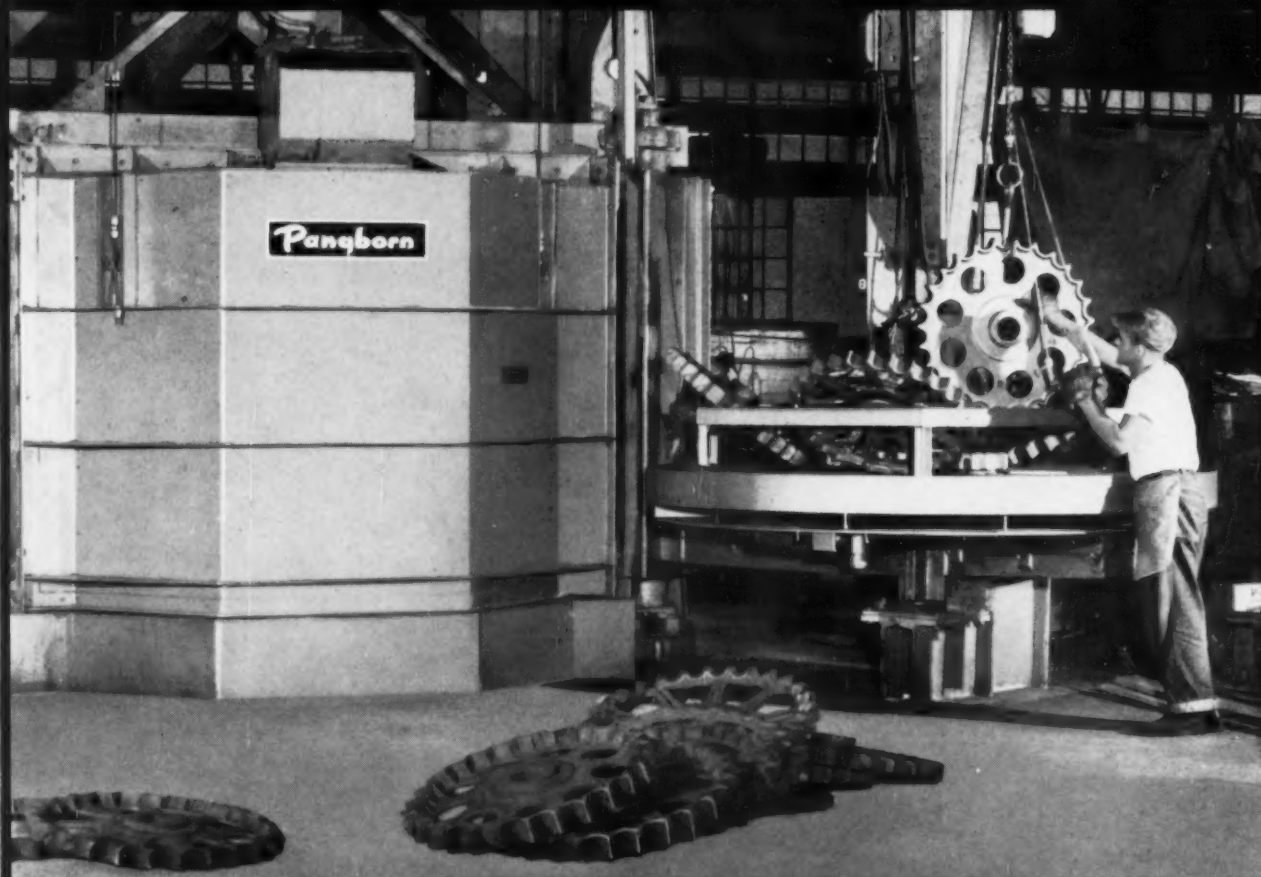
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